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In Two Sections
Section 1

Three Cost Systems Studies

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Enterprise Cycle and Fund Flows

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Suggestion System and Profits

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Recognizing the Deficiency of Depreciation Provisions Based Upon Historical Costs

by HERBERT T. McANLY

THERE IS AN OLD SAYING to the effect that nothing is certain save death and taxes. In addition to these two factors, another has proved historically to be inevitable with "managed" currency and monetized government debt, namely, currency attenuation. The declining purchasing power of the dollar looms large as a business problem. The process of decline is not formally termed devaluation. That is for the government to use rather exclusviely whenever it officially reduces the gold content of the currency unit. Left to other terms, we colloquialize the process as "higher prices." We complain that things "cost more," which is to say that the dollar buys less now than it used to. The business aspect of the problem is that funds recovered through depreciation in the determination of realized available net income of a going concern are not only inadequate ratewise, as has been more commonly explained by business experts, but will be inadequate regardless of legal depreciation rates to the extent that our money controllers manufacture inflation.

De Facto Devaluation and Future Prospects

If one draws a long-term graph of the purchasing power of the dollar in the United States, covering a period of over fifty years, and averages out the fluctuations, the result shows a long-term upward trend in prices and a long-term downward trend in the valuation of the dollar. A curve of the growth in Federal government activities and of total Federal taxes will correlate closely. These correlated trends reflect not only increasing government participation in the economy but of its actual control. Every new dollar of Federal programming will accentuate the trend, in view of the strong predilection toward debt and reluctance of the electorate to support the full impact of costly programs on a current basis.

There are various historical parallels. According to Haskel, in his work entitled "The New Deal in Old Rome", the Roman government, during the

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HERBERT T. McANLY (Cleveland Chapter 1926), is General Partner, Ernst & Ernst, Cleveland, Ohio. He has been associated with this firm for more than thirty-five years. His primary function is the direction of his firm's Management Services throughout the United States. Mr. McAnly has appeared as speaker before conferences of national groups, including N.A.A. He is a past National Director of N.A.A.

three hundred years, approximately, from the time of Augustus to the time of Diocletian, was one of the strongest governments the world has ever known. But, during that period, there was a progressive expansion of government activities and taxes, and the denarius (a Roman coin, the "penny" of the Bible), which was worth the equivalent of twenty cents in the time of Augustus, was worth about one-half cent during the epoch of Diocletian. In the twentieth century, the historical parallel is the pound sterling—and the United States dollar entered the same sequence of events when it was shifted to solely a managed currency in the thirties.

Add the apparent continuing results of national defense costs, of annual wage increases demanded and gained by labor unions, and of our basic deficit spending policy, and it seems clear that we can look forward to a period of further dollar decline. While it would be wonderful if such instability were not to occur, the judicious course for accountants will be to devise ways and means of accomplishing factual financial reporting that may be put to effective use in the realities of the situation. Even though, occasionally, we experience a temporary lull, as we did just before cold war financing specters recently overtook the best intentions of the Eisenhower administration, we need accepted accounting techniques to cope with declining dollars. And it may be hoped that, if we revise our methods to give us and business management a more realistic picture of what is actually happening to earnings, this revision will of itself exert powerful influence on behalf of enactment of State and Federal statutes concerning depreciation allowances and fairer relative taxation.

Two Areas in Which Realism Is Mandatory

The income account contains two items differently related to price changes. One of these is depreciation, which is related to long-term changes in prices and dollar valuation—on the average, a cycle of about twenty years. This is the item which is the subject of this discussion. The other is related to the effect of inventory price changes during the year currently reported. We have the solution well established which eliminates from income the effect of fluctuating costs of the necessary inventory investment, through the use of "lifo." It will not be necessary here to treat "lifo" other than to point out that the deficiency in historical cost depreciation provisions results because we have failed to develop techniques comparable to "lifo" to cover depreciation provisions sufficient to charge against income amounts representing recovery of current dollars.

Inventories generally turn over several times each year, so that charging the latest acquired costs against sales can be easily accomplished through freezing

the inventory at the beginning-of-the-year price levels through "lifo." However, plant investment turns over only one-tenth or one-twentieth per year, so that providing for depreciation recovery on a current dollar basis is more difficult. The slowness of turnover means a cumulative deficiency between historical cost recovery and the real valuation of the depreciation dollars recovered in the annual charges. The amount of depreciation is accrued in the current year, but it is not actually spent in the year in which the writeoff of the asset is computed.

Now, some difficulty to compute depreciation in r[illegible] ways, so long as we stay within the range of accuracy generally accomplished in accounting, is certainly no justification for ignoring the new possibilities. It is proposed here to explore several methods, none of which represents a perfect solution, but any one of which will be an improvement over present generally applied accounting practices, as regards depreciation provisions in which historical cost only is recovered. In doing this, it should be remembered that, until we better apply our accounting principles toward depreciation policies, we disservice business in its hope for tax relief. Normally and naturally, legislative tax provisions follow, rather than precede, business practice.

For more than ten years, a number of accountants—but far too few—have been emphasizing the need for preserving the integrity of equity capital through adequate depreciation recovery. To reduce the question from the abstract to the concrete, my favorite example will serve:

> Assume that a company purchased a machine in 1935 for $1000, that the machine is scrapped in 1947 without any salvage value and that the index of prices in 1947 is 180 as compared with 100 in 1935. A rise in the index from 100 to 180 is equivalent to saying that the valuation of the dollar has dropped from 100 to 55 cents. If this company has been following conventional straight-line depreciation methods and has estimated the life of the machine correctly at twelve years, it will have recouped $1000 of depreciation in the sale of its products, or the original purchase price, by 1947.
>
> This will balance off the account for the machine on the company's *books only*. To compensate for the fall of the dollar to 55 cents, the company should have recovered $1800 to have the equivalent of the $1000 of 100 cent valuation it invested in 1935. Looking backward from the vantage point of 1947, it is all too apparent that, during the 12-year period, the company has overstated realized earnings and has depleted by $800 the capital required to continue as a going concern. Some 50 per cent of this amount has been paid out in taxes alone.

What should be done, accounting-wise, with that $800, disregarding, for our purpose, the taxes involved? Remember, this amount represents the additional amount of depreciation which, in 1947's 50-cent dollars, as compared with 1935, the company must have, just to stay even. If the company is not to impair its capital, it needs all this money to apply against recovery of capital for replacement of facilities. Since this represents a deficiency, it would not be inappropriate to label the item as a "depreciation deficiency" and deduct it as such in the *income account,* reducing reported earnings to that extent. It should then be carried over onto the balance sheet as a reserve to prevent impairment of capital.

The above example demonstrates conclusively that existing practice concerning depreciation operates fairly only when there is no change in the purchasing power of the dollar during the life of the asset. We need a practicable means of providing for depreciation on a current price basis, a means which, if recognized accountingwise, may eventually be recognized tax-wise.

Accelerated Depreciation Not the Answer

Before going further into suggested accounting procedures, let us pause long enough to dispose of the argument put forward in some quarters that "accelerated depreciation" is the answer to the depreciation dilemma. Accelerated depreciation is sound in theory to the extent that it provides for the write-off of an asset during the useful life of the asset. For example, machine tools which usually have a life of many years may, owing to the rate of technical improvements in the industry, frequently become obsolete in a much shorter period, and their useful economic life should govern the annual quantity of their write-off. Likewise, high production activity calling for multiple-use operation certainly decreases the life of depreciable assets, but the accelerated depreciation theory deals only with the quantity of depreciation to be taken into account annually and ignores the change in the valuation of the dollar. In the case of companies owning plant and equipment bought with 100-cent dollars as compared with current dollars, it completely ignores the basic problem, of providing the necessary funds for reinvestment in assets in order to continue operations.

In a given instance, "A" agrees to supply "B" with 100 potatoes a month for one year, starting with January 1, but the potatoes keep getting smaller and smaller. By June, the potatoes are only half the size of those delivered in January. "B" then complains to "A," and "A" then offers, "All right, I will speed up delivery on the rest of the potatoes. I'll give you the rest of them at

the rate of 200 per month." What would "B" say? He would reply, "Well, that will be fine, up to the end of September—but what will I use for potatoes after that?"

This is essentially what happens in the case of depreciation continuing on assets purchased at other than current value dollars if accelerated depreciation, alone, were permitted today. The money could be recovered faster, but there would still be the same deficiency. All that accelerated depreciation would do in such a case would be to speed up the recovery of too little, and the tax relief it would afford during that shortened period would be offset by lack of a deduction in the future tax period.

Basing Depreciation on a Purchasing Power Index

What we need is a recognition of the change in the purchasing power of all funds being recovered in depreciation, the adjustment in the depreciation provision representing a reserve to prevent capital impairment. It is also obvious that any method used to determine only the annual quantity of cost to be written off falls short of this mark. The adjustment, to be realistic, must allow for the change in the value of the dollar from the date the asset was originally purchased to the end of the fiscal year being reported. In other words, adjustment of depreciation to conform to change in the value of the dollar should include not only adjustment covering provision for the current year but also for all prior years.

Such a method has as a prerequisite a reliable index of the current value of the dollar. It is my suggestion that our Government issue such an index. There is nothing inherently startling in this suggestion. It could easily be done by the application of facts already gathered and issued by the Government. There is the Department of Labor's cost of living index. Perhaps a better base might be the Bureau of Labor Statistics' wholesale commodity index or one of the several construction cost indices. The specific index selected would not be too important as long as all companies and taxpayers used the same one. We must remember that we are not talking about specific replacement of assets but adjustment of dollars recovered in depreciation provisions to their approximate current purchasing power.

In any case, the depreciation provisions for the year could be computed on any of the generally accepted bases—the straight-line, diminishing-balance or production method or any combination of these bases. The accumulated reserve for depreciation on cost at the end of the year should be broken down into the amounts which apply to the assets by years of acquisition. The accrued

depreciation applicable to the assets of each year of acquisition should be adjusted for the difference between the index of that year and the current index. The total of the adjustment would represent the total depreciation deficiency. The difference between the amounts so determined at the beginning of the year and the end of the year would represent the accumulated additional depreciation deficiency.

The additional depreciation deficiency covers both the amounts applicable to the current year's provision and the adjustment of the prior year's provisions. It is doubtful whether the latter would ever be recognized tax-wise as a current deduction item. However, the depreciation deficiency applicable to the current year's provision should be permitted tax-wise as long as the accumulated amount of these annual contributions does not exceed the total deficiency computed on the accumulated depreciation reserve. In a period of declining prices, the reduction of the deficiency provision applicable to prior years would become a credit to surplus. The adjustment of the current year's provision, either calling for a greater or lesser provision, would be reflected in the income determination.

Assets should be depreciated until the reserve for depreciation on cost equals the original cost expressed in current dollar values, regardless of the amounts which previously may have been provided for additional depreciation and credited to the reserve to prevent impairment of capital. This reserve can be adjusted at the time fully depreciated assets are removed from the depreciation reserve; the adjustment would transfer the related portion of the reserve to an appropriate capital account and permit all additions to enter the property records at the dollar level as of the date of their acquisition. Subsequent value and depreciation thereon would again be figured on the cost, with adjustments for additional depreciation based upon the relationship of the current dollar index to the value of the dollar at date of acquisition.

Realistic Reporting to Underlie Legislative Action on Taxes

Now we come to the $64 question—it is a nice example of inflation that it is now the $64,000 question! Can we ever hope to get a tax deduction of the full measure of annual depreciation as calculated on the above basis? This is, of course, of paramount consideration. It would have an important bearing on realized net earnings, for it would help business recover the attrition of earnings in taxes paid on inflated dollars. Incidental to this, there is a great deal of wishful thinking about the subject of taxes. People say, "There ought to be some way of cutting down this tax load." While it is not the function of accountants to seek tax relief, it is their responsibility to do honest financial

reporting. Let us concentrate upon that function. If honest and realistic financial reporting indicates clearly that present depreciation deductions are insufficient, Congress may eventually be expected to do something about it.

But the factual reporting must come first. How can we expect Congress to accept the truth of our claims unless we first reflect them and their impact in our own reporting? For years, we have claimed that depreciation allowed by the Government is not enough, but that is not the story generally told in our income account and the balance sheet. The story we tell the stockholders in our reporting is the Government's story, not ours. We have cut the cloth to fit the governmental rules. If, instead, we conform to the facts, the Congress might begin to appreciate the real truth and be encouraged to take some action concerning it.

In our approach to whatever method we choose to influence tax relief on depreciation, again we need not concern ourselves with legalistic attempts to define specifically what replacement values should be. That would hinder the objective. Rather, we seek a practical means of adjusting the funds—the dollars—which must be recovered, through depreciation provisions, to retain their fair purchasing power in the enterprise. We must recognize that the estimated life of an asset, which determines the annual write-offs, is not and never has been an exact determination but represents only reasonable judgment. The degree of accuracy of the index used is also not of paramount importance, as long as it gives reasonable recognition to the decline in value of the dollar and as long as the same index is made available to all taxpayers.

The objections to the use of a more or less arbitrary index in adjusting allowable depreciation provisions have centered around the idea that this is a deviation from the generally allowed practice of permitting as income tax deductions only actual costs incurred in the business. However, there are present practices in some situations, recognized as necessary to foster a sound tax approach to income determination, which do deviate from the use of actual cost to insure the equitability of deductions in the computation of taxable income. Such are:

1. Specific percentages of income are allowed for depletion in computing the taxable income in the production of oil and minerals, which have no relation to any write-off of cost of properties or acquired assets.

2. Even the theory of lower of cost or market permits a company to write down a value to market, although these values have not been introduced into the company's records in trading transactions as of the date of the fiscal year.

3. In the application of the "last-in, first-out" principle for the retailer, in order to permit him to have the same opportunity to carry his continuous necessary inventory investment at a frozen price level, as in the case of taxpayers in businesses with less complex inventories, the Bureau of Labor Statistics now publishes indices covering the price changes in classifications of merchandise and the retailer is permitted to use these in the computation of taxable income to write off latest replacement costs.
4. Also, in order that industrial companies may accomplish the objectives of "lifo," recognition has been given to the general use of indices in their inventory calculation, which necessarily introduces some degree of approximation in the results.

Price Index vs Trend Line

In any accounting procedure designed to relate the recoupment of fixed capital to changes in the price index, two things must be observed and should be emphasized. First, the recovery of capital invested in fixed assets in adequate dollar values does not necessarily contemplate specific replacement of the asset in which the capital is invested. Therefore, the recovery need not mean adjustments to specific replacement values. Second, the principle of recovery of under-investment should not be confused with devices to write up assets. Recovery must consist of dollars received in operations as capital is turned over. At the time the adjustment is made, the amount applicable to past operations must come from earned surplus. The transfer is to capital; there is no surplus arising from it. Fundamental is the fact that if recoupment is not provided for, capital impairment results.

The argument is advanced that, in many cases, the price index will decline substantially from its current level before the funds being recovered through depreciation will actually be utilized in maintaining the going investment in needed physical properties regardless of their character. Thus, provision to recoup from earnings or surplus at what may eventually prove to be an abnormally high price level, may provide for the recovery of funds in excess of the need to prevent eventual capital impairment. There certainly is some merit to this argument and, possibly, in the consideration of the needed additional provisions for replacement, some thought can be given to the long-term trend of the gradual decrease in the purchasing power of the dollar. A comparison of yearly price indices over the past 50 years, clearly indicates that there is a gradual decline in the purchasing power of the dollar.

Perhaps we should give thought to the adjustment of accrued provisions

for depreciation to a trend line rather than to the specific current index. Since the experience during the past 50 years discloses gradual decline in the dollar, the use of the trend line rather than the specific annual index would call for a consistent gradual increase in the adjustments of accrued depreciation reserves. While the use of trend line index provisions would level out the annual calculations of the accumulated depreciation deficiency, it still deals with calculation on accrued depreciation deficiency—before the fact rather than one that has actually been realized through actual cash expenditures after the fact, so to speak.

Reinvestment Depreciation

From a tax deduction standpoint, it probably would be more acceptable if the calculated depreciation deficiency would represent a portion of actual expenditures as moneys are disbursed to replace retired assets. This, in effect, would conform to "lifo" procedure in which replacement of inventory generally takes place one or more times within the fiscal year. Due to the slow turnover of fixed assets, the lag introduced by failure to recognize the accumulated depreciation deficiency on the assets in use is certainly a weakness from the standpoint of sound accounting procedure in the determination of income. However, the gap could be provided for accounting-wise, and the tax recovery resulting at the time the expenditures are actually made to replace retired assets would serve to conserve partially the capital needed to provide for the facilities required to continue operations.

Under a method which provides for adjustment of depreciation deficiency as expenditures are made to cover assets which are fully depreciated, dismantled, scrapped, sold, or otherwise disposed of, we would write off the difference between the purchasing power of current dollars and their purchasing power when the properties were acquired to the extent that current dollars of that amount were actually expended. The method would not deal with the physical replacement of property either. The reinvestment should not be related to the original cost of property retired. The method provides only for recovery of the current cost in purchasing power of the properties retired, regardless of how the recovered cost is spent, provided, of course, that current funds are actually spent for depreciable property in an amount equal to the current purchasing power cost of assets retired. The actual original cost versus the calculated current cost of assets retired would represent the tax deduction to cover the portion of actual expenditures representing the depreciation deficiency.

Related Legislation in Other Countries

Before closing this discussion, it should be brought out that, in other countries, the problem has been forced into recognition by faster depreciation of the currency and for other equally valid reasons. In Japan, for example, the Asset Revaluation Laws of 1950, 1951, and 1953 provided for voluntary revaluation of the residual value of depreciable assets as of base dates, using the government-furnished wholesale commodities price index relationships of price rises. The base dates, to show the swift movement of the problem in Japan, were quite recent, being January 1 of each 1950, 1951, 1952, 1953, and 1954. A revaluation tax of six percent of the write-up, payable within three years, is assessed. Future depreciation is calculated on the stepped-up basis. The difference in purchasing power of the monetary unit only is covered through the use of a general index—not concerned with specific replacement costs of particular types of assets. These provisions correct only for the inflation which had already come and leaves adjustment for further changes of the prices level unsolved. Perhaps the legislature deemed it hazardous to the general economic confidence to incorporate into the legal structure any suggestion that the managers of the currency ever would permit it to depreciate further after this law had been passed and, in this, a similar psychology could well be universal to all nations. In France, a somewhat similar revaluation or revalorization of depreciable assets was also provided for shortly after World War II. The method of calculating the writeup was something different, but the objective is the same.

The present income tax law of India, to encourage the establishment of new industries and to help existing ones renovate plant and machinery, provides for depreciation on a very liberal scale plus the grant of an outright development rebate. Normal depreciation is allowed at liberal prescribed rates ranging from seven percent to twenty-five percent on a diminishing balance basis. Extra depreciation equal to the normal depreciation is allowed on all new assets for a five-year period. Double-shift additional allowance is also provided for up to fifty percent of the normal depreciation. If profits in a year do not suffice to absorb the full depreciation computed according to the formula, the balance in excess of profits may be carried over against the profits of future years indefinitely.

A novel feature introduced into their 1955 act is the granting of an outright development rebate equal to twenty-five percent of cost. This rebate is in addition to other depreciation allowances and is not taken into account for determining the written down value. It serves as a bonus or special allowance over and above the recoupment of the cost through depreciation allowances.

In other words, depreciation recoupment continues until 125 percent of the cost is recovered. In order to make sure that these liberal provisions are not abused and, the funds frittered away in doubtful or speculative ventures, a system of deposits has been introduced, requiring the company to deposit prescribed amounts depending upon its undistributed profits and reserves.

Steps which have been taken in some of the other countries of the free world are far from perfect, but at least something is being done. Should we give up looking for the perfect answer and get something done here?

A National Problem

The recognition of the change in price levels in the determination of depreciation provisions is a necessary and realistic approach in reflecting corporate profits and taxable income to preserve capital needed to continue operation. Quite obviously, this realistic approach can not be accomplished by acceleration of write-offs which are limited in total to original cost, since the objective to be attained is not that of recovering original cost but rather to recover the true value of funds which have purchasing power equivalent to those making up the original cost. To achieve this goal, we must provide going businesses a means which will enable them to conserve their tools of production—our nation's chief source of abundance and wealth. This problem should concern not only management, employees and investors. Indeed, our entire citizenry faces the problems; it is one which strikes at the very roots of our national economy.

PROCESS DATA AS YOU WOULD A PRODUCT

by Frank N. Eklund, Jr.*

From my own observation and experience, the most irritating conditions encountered by accountants whose field is tabulating equipment, are rooted in a basic disregard by those with whom they must deal for the most fundamental concepts of business organization and management, to say nothing of the utter disregard in some cases of the nature of the tabulating process.

A common sense approach is to get straight on the nature of the process. Although tabulating departments are commonly regarded as service departments and do provide services, the most essential characteristic of their operation is the step-by-step, highly sensitive, process of converting raw data into machine sensible (otherwise insensible) form, followed by the

* Cost Accountant, Harvey Machine Co., Inc., Torrance, California.

process of reconverting to machine insensible (otherwise sensible) utility data. This is, in fact, a productive process, simply because a product is involved, and this product has time, place, and form utility. It is of a salable nature. Any contract data processor will bear witness to these facts. Let us look at the two critical areas in which lie the problems which beset us, the problems of the producer and those of the consumer of the product of machine accounting.

Given the proper environment, the producer of utilitarian data will approach his objective as a works manager does. Critcial considerations is given to each of the basic elements necessary in assembling the final product, including pre-design, raw material specifications, personnel requirements, operating standards, machine loading, sequence of operations, check points, quality control. Neglect with respect to any of these variable inevitably produces a loss, ill will in one form or another, and a product suitable for shipment to the pulp mill at around four dollars per ton. Effective data processing systems, having been established in recognition of the true nature of the work to be accomplished and the light in which results must be judged, are cogent reminders that the works management environment is of first magnitude, both with respect to current operations as well as in relation to adapting for the future. In brief, your data processing may be in line, on line, or off line but it will most certainly be out of line until works management concepts, principles, and practices are recognized as necessary and prerequisite to efficient operations.

Turning now to the problems of the consumer, we find that he expresses his desire or need for a product. In our case, this need is for data in a particular, utilitarian, product form. There are many items consumed which we are content to order by the pound or possibly in bulk form, say, two tons every Tuesday. Many cases exist in which this is only just short of the mark in describing the net result of practices in "ordering" data. However, what we really want is a product manufactured according to strict specifications, in most cases very strict indeed, delivered according to schedule, ready to do just exactly the job we want it to do. How to specify a firm standard of quality with respect to the data in finished product form is, in fact, the center of the problem faced by the consumer.

To those individuals who, in this modern-day business world, find themselves immersed in the problems of both the data processor and the data consumer I say, "Let's first of all take a little time to gain some basic insight into the nature of the operation. Let us take some pains to establish the proper working environment for the producer as well as the consumer."

Giving the Flexible Budget Complete Coverage For Control In a Paper Company

by NORMAN J. DUMDEI

THIS ARTICLE ILLUSTRATES the governing principles and some of the forms used in an installation of a flexible budget "tied-in" cost control system in a pulp and paper converting operation. Neither the principles nor the forms are acclaimed as original, but the effective use of these by management has been responsible for better control information throughout the operations area, and has resulted in substantial savings because this information was better portrayed to management. The transfer from the old standard cost recovery method and "non-tied" in reports giving partial coverage to operations was accomplished by methods of evolution rather than revolution. The objectives were to supply operators with better planning and control data, to eliminate accounting where it was merely bookkeeping and to bring the accountants and the operating personnel closer together on the common problem of pre-planning, measuring, and controlling operations and, therefore, profit.

Unless a complete, engineered and revolutionary installation is adopted, it is necessary to start by laying out the information regarding individual expense items and cost factors in such a manner that they are understandable to the operators and are related to a measuring unit for each effort, based on the generation or causes of the expense. This is a joint effort among accountants, operators, and supervision engineers on various types of production planning. Once the pattern of laying out the individual plant data in this manner is started, it becomes quite an interesting and informative experience to identify the generation of each cost and expense item to its true motivating cause. It is this process which results in so-called flexible budget allowances, which are a form of standards. The objectives can be rather simply stated as (1) to find out what the individual cost estimates are, (2) what causes them to be as they are, (3) what the amounts should be under various conditions, (4) how to plan these amounts and measure actual versus plan, (5) how to set the whole thing up in an arrangement of data which permits the development of a good standard or expected product and (6) how to provide a reporting system to all areas of management, which will

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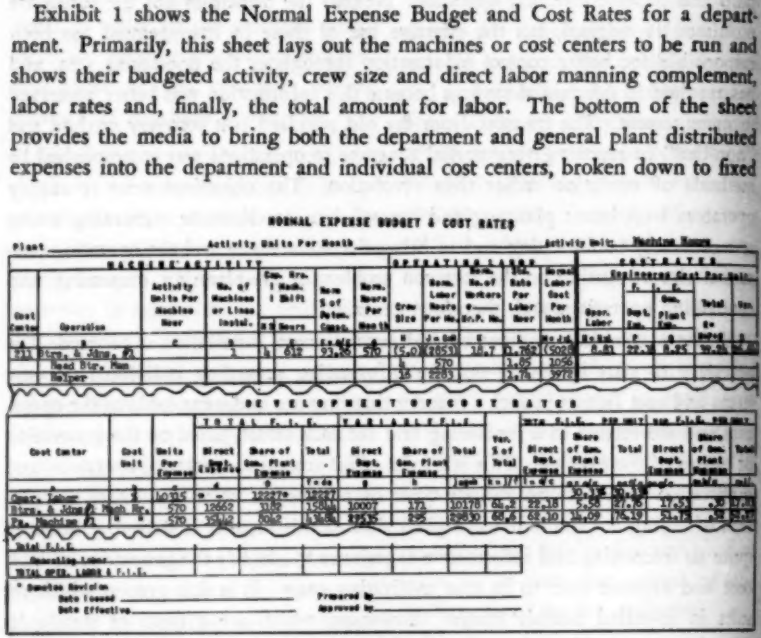
N. J. DUMDEI (Northern Wisconsin Chapter, 1948), is Plant Accountant of the Rothschild, Wisconsin plant of the Marathon—a Division of American Can Company. Mr. Dumdei has been affiliated with this company since 1923 and was named to his present position in 1952.

fully explain all the conditions of variance, either plus or minus from this expected result.

The means of obtaining these objectives are developed in this article largely by reference to forms used. This necessitates sample data in some of them. However, the figures shown in the exhibits are representative only and have no reference to actual conditions.

Getting at Activity Bases

Exhibit 1 shows the Normal Expense Budget and Cost Rates for a department. Primarily, this sheet lays out the machines or cost centers to be run and shows their budgeted activity, crew size and direct labor manning complement, labor rates and, finally, the total amount for labor. The bottom of the sheet provides the media to bring both the department and general plant distributed expenses into the department and individual cost centers, broken down to fixed


NORMAL EXPENSE BUDGET & COST RATES

Plant _____ Activity Units Per Month _____ Activity Unit: Machine Hours

MACHINE ACTIVITY | OPERATING LABOR | COST RATES

Cost Center	Operation	Activity Units Per Machine Hour	No. of Machines or Lines Instal.	Oper. Hrs. 1 Mach. 1 Shift	Oper. Hrs. 1 Mach. 1 Shift	Num. Units of Prod. Oper.	Num. Hours Per Month	Crew Size	Nom. Labor Hours Per Mo.	Nom. No. of Workers (Nearest ½)	Std. Rate Per Labor Hour	Normal Labor Cost Per Month	Oper. Labor	Dept. Exp.	Gen. Plant Exp.	Total	Var.
A	B	C	D	E	F	G	H	I	J = I × H	K	L	M = J × L	N = M ÷ H	P	Q	R = P + Q	S
911	Blrs. & Jibs #1		1	1	612	93,500	570	15.0	8550	50.2	$1.760	$15078	26.45	22.38	8.45	57.28	2.00
	Head Blr. Man							1	570		1.85	1054					
	Helper							25	7980		1.675	13370					

DEVELOPMENT OF COST RATES

Cost Center	Cost Unit	Units Per Expense	TOTAL F.L.E. Direct Dept. Expense	TOTAL F.L.E. Share of Gen. Plant Expense	TOTAL F.L.E. Total	VARIABLE F.L.E. Direct Dept. Expense	VARIABLE F.L.E. Share of Gen. Plant Expense	VARIABLE F.L.E. Total	Var. % of Total	Data S.L.E. per unit Direct Dept. Expense	Data S.L.E. per unit Share of Gen. Plant Expense	Data S.L.E. per unit Total	Sum F.L.E. per unit Direct Dept. Expense	Sum F.L.E. per unit Share of Gen. Plant Expense	Sum F.L.E. per unit Total
A	B	C	D	E	F	G	H	I	J = I ÷ F	K = G ÷ C	L = H ÷ C	M = I ÷ C	N = K ÷ 60	O = L ÷ C	P = M ÷ C
Oper. Labor	$	10315	122279	12227									20.18	20.18	
Blrs. & Jibs #1	Mach. Hr.	570	12662	5165	17827	10007	175	10178	61.9	22.38	2.00	24.38	24.67	17.63	42.30
Fix. Machines #1	" "	570	10262	8062	18324	8535	595	13830	66.61	14.70	2.09	16.79	24.19	24.78	48.97
Total F.L.E.															
Operating Labor															
TOTAL OPER. LABOR & F.L.E.															

* Denotes Revision
Date Issued _____ Prepared by _____
Date Effective _____ Approved by _____

EXHIBIT 1

and variable. The upper right hand corner provides for the development of machine hour charging rates at standard activity on standard allowances, broken down to operating labor, department expense, general plant expense, and the total charging rate. The variable portion is also disclosed for use in profit-volume study or marginal balance determination or other purposes.

Exhibit 2 illustrates a department Normal Overhead Budget form. Each element of expense is developed and it is here that each is related to its "basis unit" or the cause of the expenditure. The separate elements of cost are devel-

NORMAL OVERHEAD BUDGET

Plant: Activity Units Per Month: Activity Unit: Machine Hours

Account	Account Item	Standard Allowance: Hrs. (or Quan.) Fixed per Month	Standard Allowance: Hrs. (or Quan.) Per Basis Unit	Basis Unit	Rate per Hour	Fixed Cost per Month	Cost per Basis Unit	Basis Vol.	Basis Units per Normal Month	Labor Hours per Normal Month (Std.)	Normal Cost Per Month: Total (Std.)	Normal Cost Per Month: Variable (for Diff.)
A	B	C	D	E	F	G=C×F	H=D×F	J	K	L=K× (Std.)	M=K× (Std.)	N
1000	Indirect Labor											
	Machine Service											
	Hire & John #1 Engr.		.25	Std. Machine Hours	2.40		.60		570	142 2/3	342	342
	" " " #1 Oper. Time		.08	" " "	1.70		.14		570	46 1/3	81	81
	" " " #1 Oper. Shut Down		22.57	Per Shut Down	1.70		38.70		4 1/3	96	169	

EXHIBIT 2

oped in total from a normal month's operation based on the number of bases units are broken down to fixed and variable allowances or cost, and are so stated as to show the normal cost per month and also the unit allowances to be applied to work to measure efficiency of operations.

This same type of form is used for all general plant expense. Only once a year (or oftener as budgets or cost rates are changed) is the general plant expense distributed to departments and machines and the indirect department expenses to machines. These distributions are carried forward in the bottom portion of Exhibit 1 and are used there only to develop the machine hour charging rates. At no other time are burden distributions made, for each operating and service or general plant area is measured on a flexible budgetary allowance based on the individual expense items shown on its normal overhead budget form. This is the flexible budget part of the system which enables an operator to be measured on the work he did, against the individual allowances as set forth on the budget. It also enables production planning, once the schedule work load is known, to project the normal man-power or expense requirements for a particular operation for one or two or three days ahead.

In the necessary absence of a complete engineering approach in the evolutionary installation, many interesting experiences will develop in arriving at the breakdown of labor or expense items and, in particular, in relating each specific and individual costs to its basis unit. This is the phase of development of the system at which the accountant, the operator, and the supervisor all get a different concept of operating expenses from that formerly obtained bulk totals. The picture of a department's or a plant's cost gradually takes shape in the mind as being the result of a large number of individual expense elements. It gradually becomes apparent to everyone that a product cost or a total plant budget is affected exactly as the "basis units" or "allowance for basis unit" are changed. Once this status of understanding is reached, all feel that they have a more personal part in the operations and realize the way in which the action of any single expense item or group of expense items can affect the profits of the plant.

Preparation of the Budget

The complete plant budget is a compilation of thousands of figures, purporting to show at what cost the company expects to run its operations and produce its products at the activity level involved. In this budgeting process the information needed is broken down something like this:

1. Labor and expense budget.
   a. Direct labor costs—how much labor is required, at the activity chosen, for separate machines or centers and their agreed upon manning, and how much the company will pay its labor.
   b. Factory overhead composed of indirect labor, salaries, maintenance and operating supplies, occupancy cost, utility cost, no longer considered as bulk totals but built up from individual expense items.
2. The labor and machine output in terms of production standards best described as good obtainable output for the operations and the equipment used.
3. Material quantities, with the allowances for trim, waste, and reasonable spoilage.
4. Material prices delivered less quantity and trade discounts.
5. Method of manufacture, i.e. machine routing and material specification for the standard or expected method to make and to do business on a continuing basis for a particular product.

It is the responsibility of the plant accountant to compile the plant budget, crystallizing all the above factors into the standard product cost to serve as a basis for plant recovery (standard cost of production), for cost-profit-price relationship analysis for the products manufactured by the plant during a period, and for inventory evaluations (both finished and in process). When the accountant assembles these, it is important to note that the operators, the supervisors, and the technical staffs of the plant have had a primary part in the development of the base data and have approved each factor allowance, base unit or standard in the entire process.

This last point cannot be too strongly emphasized and is one of the major benefits to be obtained from such a flexible budget installation. When budget allowances are set in terms of the element which generates the expense, and operators and other technicians have all had a part in determining and establishing these allowances, an aura of understanding prevails which stimulates objective investigation. Is it the machine running that caused the expense? Is it winter weather or summer heat? Is it the number of sheets which have to be sorted? Is it the trim loss on the machine? Is it the tons of coal used or the

pounds of steam produced or consumed? It it the change-over time? Call time? Or, just plain idle time? Such investigation brings about realization, for example, that crews may vary with the products run, that maintenance is broken down to several categories (more or less fixed periodic associated with the machine hours, etc.) The same applies to the thinking directed towards such items as operating supplies and indirect labor. It dawns on people that such expenses are not necessarily fixed.

Another important feature is that each department supervisor's budget reflects only expenses over which he has control. Those such as occupancy charges, taxes and insurance, depreciation, payroll taxes and insurance, and some prorated services or other distributions are eliminated from the producing department budget, so that each department head sees only the cost he can budget and control. This does not mean that the total cost information is withheld from him. On the right hand corner, in the top section of Exhibit 1, the full machine hour charging rates are shown and, in the bottom portion of this form, the total amount of all expenses distributed into his department are shown. However, they are not elements built into his daily or weekly or monthly control statements.

After budgets are determined in the manner described up to this point, the product costs are developed using the machine hour charging rates from the budget sheets and, of course, incorporating standard methods, routings, speeds, materials, and other factors. These costs are developed in a proper manner, so that each operation cost is available to measure production coming from any station throughout the process and the evaluation of in-process and finished goods inventory. Likewise, in this entire budgeting and costing process, approval is obtained before a budget is activated from the respective supervisors, plant managers, and any other individual or department in the company specified by standard operating procedure. Likewise another feature is that the arrangement of data on the forms permits improved comparison of like or similar operations one

WEEKLY LABOR PERFORMANCE REPORT

DEPT. _____ PLANT _____ WEEK ENDING _____

CLASSIFICATION	LABOR HOURS			
	STANDARD	ACTUAL	LOSS (RED) OR GAIN WEEK	LOSS (RED) OR GAIN MONTH TO DATE
TOTAL DIRECT LABOR				
TOTAL INDIRECT LABOR				
TOTAL LABOR				

EXHIBIT 3

with the other, or similar plants. The plant managers or supervisors have their first opportunity to see how their indirect labor or expense standards shape up with other operations through the company and a more or less friendly competitive develops.

Daily and Weekly Reporting on Operations

Exhibit 3 is a blank form of a weekly labor performance report. For each department or sub-department, all of the jobs covered by standards or budgets in any fashion are listed on this sheet and, based on the units of production or other basis unit activity, the earned allowance (standard hours earned) is shown against the hours spent. Quite often this report is started on a daily basis until full understanding and control is developed, when it can be dropped to a weekly basis, and sometimes it can be condensed to a monthly basis. The decision as to whether to use this type of report weekly, daily, or monthly is entirely dependent on the use that will be made of it and the necessity for bringing control into operations on a short, medium or long-term basis. Naturally, this report reveals many types of variances, such as efficiency of operation, crew size and others. Particularly in a small machine center, such as a waxer, where the total machine hour rate might be about $7.50 per hour, one extra person at $1.50 or $2.00 an hour has the effect of reducing efficiency, otherwise 100%, by more than 20 per cent (assuming that no production increase was caused by the additional crew member.)

Exhibit 4 is a weekly performance chart prepared from the total shown on Exhibit 3. In an evolutionary type of installation, such as described here, the weekly labor report and the performance chart cause considerable interest and study all up and down the line. There are times, at first, when the losses revealed will not be believed. However, this causes investigation of daily time tickets and labor charges against basis units allowed or standards for performance. It finally becomes apparent to operators, accountants, and supervisors that the reason the losses occurred is that effective use was not made of the man-hours, in relation to the standards and flexible budget allowances. Once this is clearly understood, ways are usually

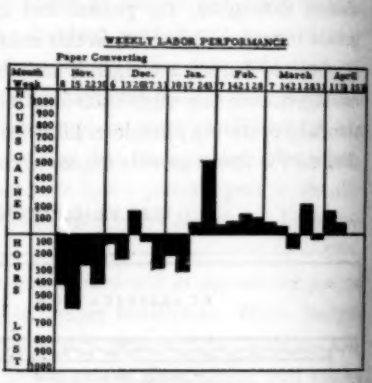


EXHIBIT 4

found for the improvement of the performance. Under the old type of reporting on a flat standard recovery basis, many of these variances on individual jobs were hidden in a total variance for the department. Particularly, there were times when many loss variances were averaged out with other gain variances and the operator or supervisor did not even have the opportunity to know his performance for individual type of expense or labor.

With this daily and weekly scrutiny of performance, it is not long before the manner and makeup of the budget is clearly impressed on the minds of everyone having to do with it. Thus, during the process of operations on a day-to-day and month-to-month basis, this scrutiny of budget allowances and efforts made to obtain them, brings about a constant surveilance of the accuracy or obtainability or fairness of the budgetary allowances or standards. As this scrutiny takes place, changes that may be necessary in the budget are apparent and, in effect, this causes management at all levels to be constantly aware of the status of their individual budget allowances, and sets the stage for approved revisions either upward or downward. Requests for a budget or standard change, made after the system is in and working, are on an informed basis. Everyone knows the exact effect on raising or lowering cost. It is an easy matter to take the unit, man-hour, or material or machine change in standard, either upward or downward, and multiply it by the rate to relate it to the activity for the basis unit. Thus, each revision of standard can be evaluated either as an increase in or decrease from existing budget level cost. This is very important for a plant or department manager. It provides him with a means for measuring the increase in cost of his operations from one budget period to another and, particularly, any budget change indicated as necessary or desirable in his operations. In fact, one of the major corollary reports from this system is a report issued monthly on revisions of standards, which lets all levels of management know the progress or direction of progress as to cost increases or cost decreases.

In a paper and pulp operation, material is an important element of cost and quite often the single biggest expenditure. Therefore, the gains or losses resulting from excess usage or excess shrinkage or spoilage or substitution can have a tremendous effect on the profit of a department of a plant. There are shrinkages in bleached pulps, paper machines, and losses in the converting area. It is quite understandable that the material factor would be considered as one of the more fruitful fields for cost reduction or control. There is a tendency to be running overweight or underweight board and paper and this practice can cause considerable losses to the paper or pulp producer, the converting plants or to customer when the manufactured products are sold on a unit or area basis rather than by weight. This leads to a simple example, shown in Exhibit 5, a

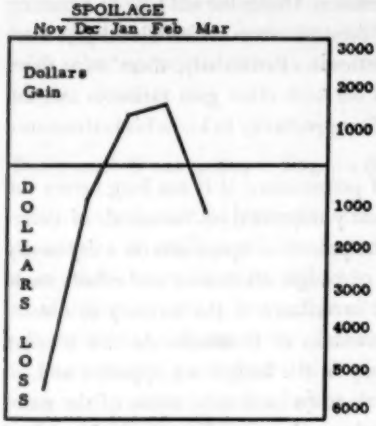


EXHIBIT 5

spoilage chart indicating how, through this phase of flexible budgeting and better standards and understanding of spoilage material usage and other factors affecting material, we can focus attention on the possible savings of thousands of dollars in this one major area.

Variances Recognized and Reported On

The statement, Variances Between Actual Expenditure and Allowances in the left half of Exhibit 6 simply lists the titles which appear on one portion of the monthly operating statement. This is largely what is sometimes called an efficiency variance under the work-done method. We try to isolate on this sheet just the pure efficiency variances for actual work done or expense incurred, related to the standards or budgetary allowances for such work. In this manner, for example, if there are five weekend clean-ups in a month, the earned allowances for five clean-ups will be used and not four and one-third, as was the practice under the old method. At the start and during the evolutionary period, we leaned over backwards to try to make this one sheet purely efficiency variances which the supervisor or department manager would agree to as his responsibility. Thus, if the existing standards did not cover the situation which developed or a situation came about beyond the supervisor's control from the variance standpoint, full allowance was given through a revision of standard or an extra allowance procedure. At this stage in evolution, our objective was, first, to determine what are the variances and, second, to sort them down to those known to be completely operator responsibility.

Further, we then wanted to arrange the many variances in separate categories and seek to find out and assign responsibility for each type. This leads to the monthly reporting form on the right half of Exhibit 6. This is titled Variance Between Product Cost Recovery at Standard Method and Earned Allowance. These are all true profit variances from the expected or standard method basis of doing business of all products at a standard level mix of activity in various centers and, of course, at standard cost of these expected circumstances. They consist of the group of variances which, under the old system, were lumped

PLANT MONTHLY OPERATING STATEMENT

Variance Between Actual Expenditures and Earned Allowance	Month	To Date
Department		
Activity		
Labor & Expense Performance-		
Earned Budget		
Actual		
Loss or Gain Due to-		
Operating Labor		
Indirect Labor		
Overtime Labor		
Salaries		
Salary Overtime		
Maint. Labor & Overhead		
Maintenance Materials		
Operating Supplies		
Steam		
Electric		
Other		
Materials-		
Earned Allowance		
Usage Loss or Gain		
Substitution Loss or Gain		
Spoilage Variance		
Total Variance		

Variance Between Product Cost Recovery at Standard Method & Earned Allowance	Month	To Date
Department		
Cost Recovered		
Allowances Due to-		
Volume		
Revision of Standard		
Non-Standard Method		
Combination		
Preparation		
Extra Allowance		
Calender & Occurrence		
Accounting		
Other		

EXHIBIT 6

in with the true measurable efficiency variances and made it almost impossible for an accountant or a supervisor to understand the variances in any one particular department or operation.

We can take only the time to refer briefly to this type of variance. The categories and figures in Exhibit 6 are examples only. We develop other variances as they are found and attempt to find responsibility for them and, in the cases in which this can be determined, a policy is set up and a responsible area is finally charged for the variance. One example of these might be sales cost variances. These would be special service runs. Sometimes they are represented by what might be called a sales quantity cost variance which develops when a product might have been sold in the five million quantity on one run, and, through some service arrangement internally or externally, the plant was requested to make it in five single lots of one million each.

These variances have come to be understood but a brief explanation for each one is appropriate to this paper. Volume is the result of over or under absorption of the fixed cost through the absorption rate assessed to product cost at the time

of budget and product cost establishment. There may be a certain amount of ratio mix and other variances, but we have found that it does not pay to sort the variances down too finely. Once a variance has been isolated, it is then determined whether it is practical to continue separating it by itself or allow it to reflect itself within the volume variance.

Revision-of-standard variance arises when a standard of any kind is changed, either upward or downward. It might cover a material or machine speed, crew size, or an indirect item. Until such time as it is approved for carrying forward into product cost, this standard change is reflected here as a revision of standard. The operator gets credit for the new standard, the cost recovery is at the old standard, and a difference between the two standards, either gain or loss, appears as a revision of standard variance.

Non-standard method variance is developed between a standard for the standard way to make a product, and the standard for a non-standard way which has been approved and the plant ordered to proceed with it. As these variances are developed and an analysis is made of them, it becomes apparent that, sometimes, the plant runs a non-standard method without authorization. When this condition is found, the variance is treated as a plant responsibility.

Combination variance is similar to a non-standard method and a ratio mix variance, and is peculiar to industries in which layouts and multitrims are made. If the standard method of make is "three-up", and the product is run "two-up" for any reason, the variance comes under this heading. It is a special type of non-standard variance. Combination variance can be caused by limited supply of the right kind of size of raw material, as in the case of printing or waxing, or similar operations, or it can be caused by the non-compatibility of the inks or waxes or coatings resulting from the lack of sufficient orders of the right size to run in the full layout or width of the web.

Preparation variance has another common name, "length of run." In constructing our product costs under a standard cost approach, it is necessary to build a definite agreed-upon type and quantity or dollar amount of preparation into the costs at the various stages of manufacturing operations. When production takes place, a make-ready order is issued instructing the workers to complete a specified kind and type of make-ready. The efficiency with which this make-ready is made, is measured and reported on as such in a manner already indicated. However, beyond this there may be more or less make-readies requested than the sum total built into the product cost. Thus, the preparation variance is the difference between standard amount of preparation costs included in the products made as compared to the standard allowed for the preparations actually made. This highlights, in some cases, a production planning problem of having the

right sequence or combination or layout of orders. In other cases, it highlights the effect of service runs or unnecessary preparations. Many other interesting cases with possibilities for economies are revealed by careful attention to the preparation variance.

Extra allowance variance, referred to before, arises from attempt to "purify" the efficiency determination. An approved extra allowance is given for cases in which it is considered necessary and the difference between this extra allowance standard and the standard for the standard method is shown under this category.

Calendar and occurrence variance is a familiar one and yet, under the old standard cost recovery, it was seldom developed. An average amount of heat, for example, may be credited to a department each month. In the summertime, it reflects a large gain and in the wintertime a large loss. There are other cases, such as, for example, instances in which stone or coal might be hauled by boat during the summer months and stored on a dock. An average is determined for costing purposes. Under the old cost method, a using department is given credit for average cost. During the summer, when boat-freight stone or coal is used, a large gain occurs and during the winter a large loss. These and many other illustrations of this type of variance led to the all too familiar experience in which accountants point to a large variance in the operating statement and tell the operator to pay no attention to that, as it will average out at the end of the year. The difficulty is that often it does not average out and it is never known whether the failure to do so is due to inefficiency of expenditure or the ratio mix of winter to summer conditions averaged. Calendar variance breaks out the allowance for work done and the average included in the cost recovery.

Accounting variance is composed of minor variances which may come from fractional differences, or changes in amounts of depreciation, or tax charge, or a change in the fringe benefit tax, or witholding amounts, or some other factor primarily subject to accounting treatment. These are items directly under the responsibility of an operator. As new budget periods come into being, these accounting variances will be provided for but, until then, they are allowed to stand as variances.

"Other" variance is a collection point for all variances not classified separately. It must be honestly admitted that occasionally a small error or ratio mix variance is allowed to occur here. It has been found that the expenditure of excessive clerical work to refine all variances to the final cent of accuracy is impractical. If we know that the major variances are computed correctly, any remaining off balance amount due to fractions or ratio mix not accounted for, if significant in relation to total, is allowed to collect here and is understood and not questioned by either operators or accountants at any level.

We have found variances a very informative and lucrative field of investigation. Under the old system, the one gross recovery amount developed for comparison to department actuals made it impossible to determine whether variances were due to combination, non-standard, method, revision of standard or any of the other variances dealt with here on the second sheet. It was only known that a sizeable variance existed.

As the understanding and use of the budget system is developed, many things became clear. For one it becomes apparent to operators that so-called volume variance is not always caused only by the failure of the sales division to have the proper amount of orders on hand. It becomes quickly apparent that, if there are ten machines and enough orders on hand to run ten machines for 5, 6, or 7 days a week, there is a volume loss due to the inefficiency of the machine, if the operators only obtain 90 per cent efficiency while running these machines. Also, if an indirect job or expense is related to a machine hour as a basis unit and if the machine produces only seven hours of standard work in eight hours, operators are entitled to only seven eighths of a standard day's allowance for the job. In this, and many ways, the effect of utilization of labor, materials, and supplies on the profit of the company becomes increasingly clear in the minds of operators.

Profitable Meeting of the Minds

This description of our history of installing and learning to use a flexible budget tied-in-cost recovery system on an evolutionary rather than a revolutionary basis is not original with us, either as to principles or the general type of forms used. However, it is certainly a new experience to any operation that has not had such a budget. It immediately brings about cooperation among accountants, engineers, production planners, operators, supervisors, and anyone having anything to do in any way with any item of cost within the plant's operation. An emphasis is placed on standards for every operation and there is a clarification and quantitative measurement of the basic motivating causes for each expense. When an attempt is made to better the budget, it is quickly found that this coordination of effort in all areas must continue. Each supervisor, department head, and plant manager is kept much better informed of the progress of his efforts within his area of control than he was formerly. The benefits of applying such a system are finally translated into dollars of profit in the form of reduced costs or a better way of operating or of producing products.

An Accountant Draws Some Blueprints For the Foreman

by CLAIR W. BENDEL

THIS IS THE STORY OF SUCCESSFUL communication between the people responsible for paper work and the individuals responsible for manufacturing the products our company sells. Too often, the accountant adopts the role of pedagogue in his dealings with plant foremen by using a series of miniature textbooks covering the accounting requirements.

EXHIBIT 1

Shop foremen are intelligent individually and collectively. Given a blueprint, a bill of materials, the specifications, and the tools to work with, the foreman will build anything, from a spit for your outdoor fireplace to an electronic machine. Since the blueprint is a communicating medium readily understood by the shop people, we reasoned that the accounting problems would be more readily understood if we could set up both the problems and processing steps as a series of accounting blueprints. We also reasoned that our purpose would be served if we presented our problems to any and all who could make some contribution to the solutions. Consequently, we offered our story to mixed groups of foremen, planners, schedulers and timekeepers at the same time.

The information to be conveyed to the foremen was painted on varicolored show card stock. Data was reduced to simple, easily identified symbols and abbreviations and was color coded to aid the viewers in following it from one illustration to another. The narrator used an easel to display his illustrations, turning the cards over as he commented on each one, or hanging them in a line when the data appearing on the card was related to material presented on subsequent cards.

EXHIBIT 2

C. W. BENDEL, Lancaster Chapter (Reading 1943) was Cost Accounting Manager of the New Holland Machine Company Division of Sperry Rand Corporation at the time of his death in December 1957. Prior to this he was employed by the Textile Machine Works of Reading, Pa., and served as Budget Director and Procedures Manager for Jacobs Aircraft Engine Company, Pottsdown, Pa.

Parallel of the Process and of Control Information

THE ACCOUNTS

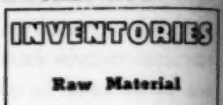


EXHIBIT 3

You are all familiar with the titles accountants have assigned to the production inventory accounts. You know which items are usually included in each account and why they belong there. We want to show you how items and the dollar values are transferred from one inventory account to another and the effect that your actions, or failure to take action, has on the end result.

This is a typical scene as far as manufacturing operations are concerned. You all know how raw material is moved from the stockrooms to work-in-process areas where various operations are performed to convert it to a manufactured part. Purchased items may also change their identity through production operations and the addition of other parts. Eventually, many manufactured and purchased parts are combined to make the finished unit. The signficant fact, as far as this illustration is concerned, is that sooner or later everything goes through work-in-process. Since this is the case, it is only logical to assume that if work-in-process is controlled properly, the inventories that feed it and the inventories that are fed from it will also be controlled.

You are all aware of the problems which are created when a part is missing or an operation is omitted. You know that we cannot complete a machine unless we have all the parts and, if the machine is not completed, it cannot be sold. Did you know that accountants are also building the products which our company makes and sells? The only difference between our efforts and yours is the media used in the process. You build products by processing and asembling tangible objects made of steel, rubber, cast iron, etc., and we parallel your operations by processing and assembling the pieces of paper which represent the material and operations required to convert them to a salable product.

THE PROCESS

EXHIBIT 4

This illustration is representative of the steps taken in the manufacturing of a part and the paper-work which follows it. In order to get the material from the warehouse, one prepares a requisition. When

the operator performs the first operation, a time card must be prepared or he will not get paid. This is also true for the second operation, and finally, a delivery ticket is required to place the manufactured item in stock. Although this is a simple illustration, it shows the pattern which is varied only by the complexity of the parts to be manufactured. The paper work generated when a part of machine is manufactured follows many trails and stops at several way stations en route. Since it is our intention to point out the significance of work-in-process, we will ignore the intermediate steps and give you an accountant's blueprint of that inventory classification.

The Process and The Papers

EXHIBIT 5

When parts are to be made, orders (called part-lots) are issued which tell you what to make, how many, what to use, and how to make it. These part-lots also provide the accountant with the means of identifying and controlling the ever-changing content of work-in-process. Each part-lot is a sub-account with the overall classification. The paper work which was created in the previous example and all other paper work coming from the shop represents dollars to be transferred and shuffled until they eventually rest in their proper place. The material requisitions are priced and extended at standard costs and dumped into the part-lot converter. The labor tickets which made up the payroll and additional costs in the form of departmental overhead are added to the mix. If material is lost or scrapped in production, that value is siphoned off and charged to expense. The value of good finished pieces, as represented by delivery tickets, is also removed. When everything goes according to plan, in other words, meets the standards, the crucible will be empty. There are times when the dollars withdrawn from the pot as finished parts are greater or less than the amounts charged in. When this happens, there is a variance on the individual part-lot which must be analyzed, explained, and adjusted.

The Part-Lot Cost Kettle

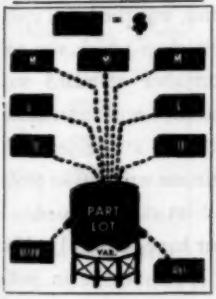


EXHIBIT 6

The cost accountant knows what to do with this variance in many cases, but, too often, his analysis reveals discrepancies that are due to missing paper

work and he cannot be absolutely sure of the action required.

This exhibit shows the elements of standard cost in Part Number 40275 as developed by the cost department. (Although our usual practice calls for development of standards on an individual piece basis, we have used a standard lot of 100 pieces for this presentation.) You will notice that the standard quantity of raw materials has a value of $100 and that the first and second operations add $50 and $90, respectively. Two pieces of Purchased Part 27165 are added on the third operation at a cost of $300 for the part and $50 for labor and overhead. Two pieces of Manufactured Part 28145 are added on the fourth operation. These pieces have a value of $200 and the cost of adding them is $40. When we add all the elements of cost, we find that the standard for 100 pieces of this part is $830.

Part Cost — As It Should Be

STD COST		
PART 40275		
100	81068-RM	$100
	OPER. 1 L&O	50
	OPER. 2 L&O	90
200	27165-PP	300
	OPER. 3 L&O	50
200	28145-MP	200
	OPER. 4 L&O	40
	TOTAL	$830

EXHIBIT 7

The Story of Results and What to Do About Them

Now, let's see what happened when the first lot went through the shop. When we compare the total actual costs reported on Lot No. 1 with the total standard costs, we see that the actual dollar value charged to this part-lot is $9 more than the standard cost of the parts delivered. Comparison of the elements of cost reveals that this variance occurred on operation No. 2. The next question is "Why?" In this case, the explanation is simple. Our standard cost, which was established for valuing inventory at the year end, was predicted upon a performance standard for the shop which was not attainable. The shop performance standard was change, but the accounting standard will be retained until new standards are established at the year-end. This type of variance is a legitimate write-off to profit and loss accounts, and the part-lot can be closed.

—And As It Turns Out

ACT. COSTS		
PART 40275 lot-01		
100	81068-RM	$100
100	OPER. 1 L&O	50
100	OPER. 2 L&O	99
200	27165-PP	300
100	OPER. 3 L&O	50
200	28145-MP	200
100	OPER. 4 L&O	40
	TOTAL	$839
	100 DEL. at STD.	830
	Var. $	9

EXHIBIT 8

This next exhibit shows what happened to Lot No. 2. At first glance, it would appear to be in good order since the variance between actual and standard

costs is only $7. Work-in-process could be cleared by writing off this relatively small difference to profit and loss, but we should not ignore the possibility of counterbalancing deviations within the part-lot. Comparison of quantity data with standard quantity requirements reveal that only 10 lbs of raw materials were charged to this part-lot. On Operations Nos. 3 and 4, the quantities reported are less than the standard requirements, but they coincide with the quantities delivered. Since all deliveries are counted before acceptance in the stockroom and in operator's pay is tied in with the quantities reported, we can assume that these quantities are correct and that 10 pieces disappeared after Operation No. 2.

Large Variances Hide

ACT. COSTS		
PART 40275 lot-02		
10	81068-RM	$ 10
100	OPER. 1 LAB	50
100	OPER. 2 LAB	99
200	27165-PP	300
90	OPER. 3 LAB	45
200	28145-MP	200
90	OPER. 4 LAB	36
	TOTAL	$740
	90 DEL. at STD.	747
	Var. $	7

EXHIBIT 9

On the monetary side, we find that the deviations from standard in raw material, Operations Nos. 3 and 4, and the delivered value are in direct proportion to the quantity differences. We also find a difference between actual and standard on Operation No. 2. The reason for this difference was established on Part-lot 01.

This illustration shows how Part-lot 02 was reconciled and the results of the investigation of differences. The actual cost, as developed, was $740. The variance on Operation No. 2 would normally be written off to profit and loss, so we subtract it from the actual cost. The raw material requisition was written as 10 lbs. instead of 100 lbs. Consequently, we must add the value of that material to effect our reconciliation. Since we produced only 90 pieces on the third and fourth operations, we had too many purchased and manufactured components at those stages. (The extra parts were returned to stock, without paper work, in a general cleanup of the department.) Therefore, the value of these pieces should be subtracted from the actual cost. We found that ten pieces were scrapped after the second operation and no scrap report was prepared, so the standard cost of the ten pieces (material plus labor and overhead on Operations No. 1

VARIANCES UNMASKED

Actual Cost	$740
LABOR VAR.	9
BAL.	$731
SHORT	+90
OVER	-30
OVER	-20
SCRAP	-24
TOTAL at STD.	$747

EXHIBIT 10

and 2) must be subtracted. The end result, after adjustments, ties in with the total value of the parts delivered at standard cost. Our investigation disclosed one reporting error on a requisition and three missing documents. The infrequent errors in reporting quantities moved from stock are troublesome. The missing paper work is the real bane of an accountant's existence. It is not our purpose to discuss causes of errors and missing paper work, but we would like to show you the effect.

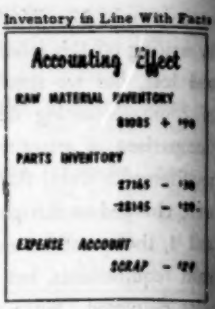


EXHIBIT 11

Now, we would like to show you what would have happened on the books of account if we had cleared work-in-process by writing off the $7 variance on this part-lot to profit and loss without analyzing the order. The raw material inventory account would be overstated by $90. Since the excess parts were returned to stock, without paper work, the parts inventory would be understated by $50 and, finally, the scrap account would be understated by $24. We will concede that in many instances, the plus items on the part-lot will be counterbalanced by minus items on another part-lot. However, you all know that the results of the comparison of book and physical inventory values at the year-end seldom support this contention. The effect on the books is important, but the fact that the accountants were unable to parallel the production of this part without a considerable amount of analysis and investigation is of greater significance. In this example, we were able to determine the correct raw material quantity and value by examining the requisition. It was necessary to visit the departments which performed the second and third operations and discuss the piece-count differences with both foremen and the operator to establish the fact that pieces had been scrapped after Operation No. 2 and not reported. The unused purchased and manufactured parts were located and correcting documents prepared after consultations with the production foremen and stockroom personnel.

Deviations from planned procedures to make ready, obtain material, perform operations, and make final delivery at the shop level usually mean lost man-hours. You are all cognizant of the effect of lost time on company profits. The cost department also works according to a plan that budgets man-hours and determines the size of the staff. Failure to process paper work not only

means lost time in the cost department, but it also means that the accountants will be making inroads on your time because they must come to you for the answers.

The Point to Be Defended

EXHIBIT 12

Sooner or later, all roads come to a bridge. Military strategists have long been aware of the importance of bridges. The success or failure of a campaign has often depended upon the defense of such focal points. Work-in-process is the bridge over which all material eventually passes as it travels from the raw state to a manufactured part or to a sub-assembly and eventually a finished machine. Control this point and the accounts from which it is fed or to which it eventually goes will also be under control. The cost accountant is the last line of defense. You foremen, timekeepers, schedulers, and planners can take up the initial shock by seeing that the paper work which you control is done properly.

The Story "Took"

This material was presented at the monthly foremen's meetings of each of the three plants of New Holland Machine Company. Nearly two hunded plant supervisors, foremen, schedulers, planners, and timekeepers followed the blueprints of the cost accountant through each stage. The intelligent questions which followed the presentation and the suggestions for solutions offered to certain specific problems that were brought up during the period indicate that the foremen and shop people have a lively interest in what we are doing. They want to see the job done right and are willing to help when they understand the problem. It is our responsibility as accountants to supply blueprints that can be read.

BETTER RETURN FROM SCRAP SALES—by F. M. SMITH*

IN CONJUNCTION WITH THE INCREASING emphasis on cost reduction as a means of improving the profit position, it is also important to spend some time examining the possibility of increasing the dollar return from the profit and loss item called other income. We have found that, through an emphasis on getting the maximum return from the sale of production scrap, we have realized a significant increase in that category. What we did was simply to emphasize two points: (1) accumulate our scrap in a manner which would make it attractive for the scrap dealers to bid on it and; (2) interest a number of scrap dealers to bid competitively. The procedure we put into effect was simple and inexpensive and we increased our return on the same volume of scrap by at least thirty per cent.

The shop people had not been paying too much attention to segregating the scrap by basic metal content. The scrap would be dumped into the nearest scrap bin, with the result that aluminum and steel borings, etc., would be mixed. Added to this would be a certain amount of trash (paper coffee cups, lunch refuse, etc.). All in all, it was a rather unattractive package for the scrap dealer to pick up, and his price reflected this fact. The job of getting the production scrap properly segregated was assigned to our surplus property supervisor, who worked closely with our production superintendent. No additional costs were involved other than a few signs and, after a short learning period, the proper cooperation was obtained from the shop personnel. The value of this segregation is illustrated by the wide range in prices for the different types of scrap; i.e., aluminum borings approximately $235 per ton, steel borings $19 and scrap iron $37.

As to competition, we had, traditionally, dealt with one local scrap dealer. When we had a load of production scrap, we would call him in, weigh the scrap, and be paid at his going rate. However, with the scrap now in good order, we thought we should take a new look at the price we were getting for it. It was decided to obtain competitive bids from other local scrap dealers. It is interesting to note that, after we issued invitations, successful bids were made by dealers as far as fifty miles away.

Our surplus property supervisor has employed various techniques to make it easy for the scrap dealers. For example, the various categories of scrap are collected in big tubs which, when full, are taken outside and stacked in the scrap area. When a significant number of tubs have accumulated, the scrap dealer is called and immediately sends in his truck. The tubs are quickly loaded on the trucks with a forklift, the dealer takes the tubs to his yard, dumps them, and returns them within a day. A simple gate pass procedure keeps track of the tubs and public weighmaster slips keep track of the tonnage. This ease and convenience in handling the scrap has reduced the dealers' own costs and has enabled them to offer higher prices for the scrap. For example, the high bid made to us is frequently in excess of the scrap prices quoted in "Iron Age."

In summary, the example of scrap indicates how profitable it can be to re-examine some of the procedures utilized to handle the day-to-day, routine other income operations of a business.

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*Supervisor, Systems and Procedures; Ordnance Division, Food Machinery and Chemical Corp., San Jose, California.

The Fallacies and Postulates of Accounting

by MARION H. SIMPSEN

THERE ARE MANY WHO BELIEVE that "accounting is an exact science" and that the accountant can express the results of a business enterprise in dollars and cents with exactitude, including, I fear, many accountants, managers, stockholders, and others interested in business enterprises, who must make important decisions based on the accountant's figures. Hence, one of the obligations of the accounting profession today is to clear up this area of misunderstanding. There may be some hesitation about exposing ourselves, so far as that is involved in correcting misunderstanding, but it is a challenge we must meet. First, we must be sure that accountants, themselves, fully recognize this limitations of accounting reports, principles, and theories. As a beginning, let us explore what is underneath the idea that accounting can be expressed in dollars and cents with meticulous accuracy.

That there are limitations to accuracy achievable in most occupations, whether trades or professions, has long been recognized. In the budgets for manufacturing expenses, an allowance is made for spoiled work. This is recognition that spoiled work is necessary for proper efficiency, since to eliminate this item of expense entirely would cost far more than the cost of the spoiled work. The parts stocks in automotive repair shops offer mute testimony to the fact that, even in the production of automotive equipment, which possibly is the most efficient and accurate production the world has known, there are limitations preventing the production of the perfect automobile. The legal profession is, in a sense, a repair profession and the constant new interpretations put upon our laws by the courts are examples that no profession is infallible. In accounting, however, there is a tendency to assume that accountants should not make errors and to raise a great hue and cry whenever an error is discovered in accounting reports. Many accountants share this viewpoint and other executives seem to delight in discovering mistakes on the part of the accountant.

In view of this reaction to our errors and inaccuracies, perhaps we should ask ourselves two questions (1) Why is this? and (2) Could we have brought it about ourselves? Just possibly, the accountant has not acquainted the other members of management with the peculiar problems attaching themselves to the preparation and interpretation of accounting reports.

MARION H. SIMPSEN, Shreveport Chapter (Peoria 1943) has been Corporate Controller of R. G. LeTourneau, Inc., Longview, Texas since 1953. Prior to this, he was associated with the Peoria Division of R. G. LeTourneau, where he had served as Cost Accountant, Cost Supervisor, Assistant Controller, and in other managerial capacities. Mr. Simpsen, a previous contributor to the *Bulletin*, is Past President of Shreveport Chapter.

A Decalogue of Fallacies About Accounting

As an avenue of exploration, I have chosen a number of accounting fallacies or misconceptions of accounting principles and practices, which have popular acceptance by many managers, stockholders and, perhaps, by many accountants. No doubt there are a number of other fallacies, but an examination of the ten I consider most common should be sufficient to stimulate some thinking.

1. *Depreciation provides for replacement of assets.* This is a myth that is being exploded more and more. Many accountants and others outside the accounting field now recognize depreciation as merely an estimate of the charge necessary to make some provision for the cost of depreciable assets in current profit and loss and balance sheet statements. A depreciation charge does not provide cash in itself. Furthermore, with present inflationary trends, it does not even, in the opinion of many accountants, provide adequately for the cost charge. Neither does the depreciation charge actually measure physical life of assets, because internal revenue regulations and company policies and practices influence to a large degree the period over which an asset will be written off. This period often bears no particular relationship to the potential physical life of the asset. The factor of obsolescence also makes the depreciation charge at the best an educated guess.

2. *The cost accountant can determine actual cost.* The cost accounting department of any manufacturing concern can perhaps arrive at unit costs for products which, when taken as a whole, will adequately measure income against expenses. However, when it comes to determining these "actual" costs, the factors of depreciation, allocations of overhead, inventory practices such as "lifo", "fifo", etc., will affect the determination to such a degree that the cost of any one product must, possibly, be expressed in a range, rather than in one figure. For example, Product X cannot be said to cost $1.675 but, perhaps, should be set out as costing between $1.65 and $1.75. It may be that the difficulty of ascertaining such cost can best be explored by taking, as an example, a very simplified accounting problem.

For instance, suppose someone starts in business as a housing contractor and the first endeavor is the building of one house. The general impression might be that, when this one dwelling was completed, the only step necessary to arrive at the actual cost is for the accountant to total all the costs sustained in building the house. However, as the accountant begins this compilation he runs into the problem of what to do with the cost of the usable tools the contractor still has when the house is completed. He could solve it by charging the entire cost of the tools against the house. However, if the contractor continues in busi-

ness, should the second house, an exact duplicate of the first one, cost less than the first one? To solve this problem the accountant adopts a depreciation method and sets a value on the tools and equipment still in usable condition.

Suppose that the problem is further complicated by the fact that the contractor is building three more houses, all similar but in different locations and at varied distances from his office. Should the accountant allocate the cost of automotive equipment necessary for transportation of materials on the basis of the direct cost of the house, on the basis of the direct labor, or on the direct materials? Should he take into account the fact that each delivery to House 2 is going to require more time and mileage than House 3? How should he allocate the time of the contractor among the four houses now being built? As the design, perhaps, was completely worked out on the first house, should it have the larger allocation of the design charge? All these and other questions illustrate that there can be *no* finding of *actual* cost and that the cost figure arrived at must be accepted as containing considerable estimating. Moreover, we have taken a rather simple job cost situation. Now take a look at the complex process and the multiplicity of products of a manufacturing concern and you will reluctantly confirm the conclusion that there is no actual cost. At least, if there is one, the accountant never knows when he has it.

3. *Income is measured accurately by monthly, quarterly, and annual statements.* In considering this contention we should examine further the word "accurately." Perhaps if we substitute the word "adequately", the assertion can be accepted as being more nearly correct. This distinction is important in many of our accounting reports and figures. Often they can be described as adequate when they are, in point of fact, not accurate. As said above an actual cost cannot be determined. Therefore, it follows that actual income cannot be determined on the period basis. Although the belief that it can be so determined annually is the basis on which our present income tax laws are set up, there has been recognition of the fallacy short-term income determination by the provisions for carry-back and carry forward of losses. The truth is that, without liquidation, no true income can really be determined for any business. In the meantime taxes must be paid to the government and dividends to the stockholders. It has become commonly accepted that an annual income statement is an adequate basis for these purposes. However, every accountant, stockholder, and manager should realize that the income shown is not completely accurate, due to the limitations connected with accounting for a period less than the life-span of an enterprise and certainly for a period as short as a year.

Some might agree to this for a large enterprise but still feel that, in a small retail business, there would be no question but that an income statement could

be completely accurate. To explode this fallacy, you have but to ask a retail merchant, "What will you realize from your December 31, inventory?" He has placed a valuation on his stock but knows that the realization of this valuation plus the usual markup is an unknown factor. He may, for instance, have purchased one lot of men's suits at $50 each to retail at $100 each. Six of these have been sold at this price and profit to the extent of $50 per suit realized, while the remaining six are in the year-end inventory. If he is later forced to sell the others at a lower mark-up, perhaps at $75 each, the question is, "did he realize $50 per suit on six suits and $25 per suit on the other six or did he realize $37.50 each on twelve suits." If the last supposition is accepted as correct, then the income was determined incorrectly at the close of the year in which the first 6 were sold.

4. *The use of cents or fractions of a cent indicates extreme accuracy in accounting figures.* In the instance of cash, the amount shown on the balance sheet as cash in banks should be exactly accurate. (However, is the "cents" part useful?) As to other items on the balance sheet, on the income statement, or as to detail cost figures, the use of cents or the carrying of the decimal point still further indicates merely that mathematical expediency has been employed. For instance, with job costs, we sometimes produce a great many items on one particular job, take the total job lot cost, and divide by the number of items produced, to come up with a unit cost. This cost may be carried to four decimal places. This does not mean the accountant has been able to determine that the cost of this particular item can be measured accurately to within ten thousandths of a cent. It merely indicates that, to exhaust the inventory of this particular lot and to cost large quantities, it has been found expedient and necessary to carry the decimal point to four places. Many standard costs are computed on this basis and, no doubt, are adequate cost figures, sufficiently accurate for all purposes served. However, the use of such figures on reports to others, without a clarifying explanation, frequently creates an entirely unwarranted impression of exactitude.

5. *True net worth is revealed by the balance sheet.* No doubt many, many people—stockholders and managers in particular—look anxiously to the net worth section of the balance sheet of the enterprise in which they hold a financial or other interest. However, this figure as shown, can only be considered as an estimate and subject to the latitude in accuracy necessarily implied by depreciation policies, inventory valuation practices, and a number of other accounting practices which have evolved from the need for periodic balance sheets and income statements.

6. *Financial statement figures are comparable between companies.* Here, surely, one would suppose, in recognition of the vast amounts of literature available on accounting and the professional organizations of accountants, there has been enough consistency attained in accounting methods to make comparisons between companies possible. However, when we examine the facts, we find that, even though methods of statement preparation are the same, the individual judgment which must go into certain overhead allocations, estimations of inventory valuation, classifications of accounts etc., make comparisons between companies virtually useless, except when the differences in methods etc., are well enough known so that reasonably adequate adjustments may be made for them.

7. *Audits by independent accountants prevent embezzlement.* Possibly the most popular fallacy is that the independent accountant's annual audit is a check on the honesty of all the employees in the financial departments. Of course many company presidents sleep better as a result of this concept of the work of the independent accountant. The danger is that the company manager will fail to realize the need for good internal control, whereas, to a great extent, the prevention of embezzlements is the responsibility of the internal audit staff, the controller, and the entire accounting staff. With no reflection on the independent accountant, we must realize that his audit is concerned more with the balance sheet and the income statement. Although he normally makes some check of internal control methods, he is prevented by time and fee limitations imposed by the client from making a thorough check of every possible means by which company money and property can be misappropriated.

8. *Overhead distributions are fully accurate.* Most accountants have prepared and reviewed schedules for the distribution of overhead by departments and by plants. In many cases, the mathematical accuracy is unquestioned and a great effort is made to provide a correct allocation among departments. However, here too, we must use the word adequate, instead of accurate, to describe this process. Human judgment enters into it to such a large extent that we cannot describe it as being completely accurate. Let us examine the problem further by attempting to clarify what overhead really is. There are many definitions used but, fundamentally, overhead is a product cost impossible or impractical to charge directly with accuracy. If this is so, how can it be charged accurately by allocation? Overhead can be classified into two groups: (1) expired and applicable to current production and (2) unexpired and applicable to future production. With the first, the accountant must solve the problem of function or product allocation, while, with unexpired overhead, he has first

the problem of period allocation and then must also deal with function or product allocation. In view of this, is it not time we stopped using rates such as 201.17, which create an impression of a high degree of accuracy that is non-existent?

9. *A high overhead rate is an indication of inefficiency.* Here is one of the most surprising of the fallacies. With all the trend toward automation and other improved methods in the shop, there is still a prevalent idea that a high overhead rate indicates a high product cost. To the contrary, a manufacturing enterprise can achieve a low overhead rate by increasing the cost of direct labor and, therefore, increasing total costs. On the other hand, the company can decrease direct labor by more efficient operations and by increased automation (thereby increasing the overhead rate) while achieving ever lower costs. It is important that all accountants, managers, cost reduction personnel, etc., realize this, since, often, cost control measures can be entirely misdirected by concentration on bringing the overhead rate down when, perhaps, the emphasis should be on direct labor and material costs.

10. *Figures don't lie.* This statement has often been made, with the added comment, "but liars figure". If you accept the latter comment, it follows that the first is untrue. If liars can figure, they can also issue figures which lie. We have but to look back over the history of the last few years to see that figures can conceal bankruptcy and embezzlement and can also conceal financial speculations.

Three Postulates Which Are Less Than Axioms

As the accountant proceeds to "explode" these fallacies in the minds of others, he must explain that, in spite of the difficulties of their accurate determination, management and others must have unit costs, departmental, plant and division costs and period costs (weekly, monthly, quarterly, etc.) Income tax returns must be filed annually and other requests for accounting information must be satisfied, often on short notice. Therefore, it is necessary that a number of postulates be accepted. It has been said that these postulates would be indefensible if they were not indispensible. The three chief postulates referred to are:

1. The monetary unit is the best common denominator to use in measuring and reporting business activities.
2. A corporation (or other form in which the enterprise is conducted) will continue to operate indefinitely.

3. Profit or loss should usually be shown on the basis of completed transactions.

These postulates, time-honored and fundamentally necessary as they are, are no longer considered as completely axiomatic. Consider the first one, which is based on the assumption that the dollar has a constant, unchanging value. This certainly is not a correct assumption today. Many accountants advocate the interpolation of accounting figures to reflect the fluctuations of the dollar. In many instances, this interpolation may well be necessary, provided those using the converted statements are aware of the basis and the purpose served. There is no doubt that the replacement of inventories and capital assets during the period of rising prices has overstated corporate profits. The adoption of the "lifo" inventory method is one of the corrective measures that is finding increasing favor.

However, the problem of re-stating capital assets is one that, in my opinion, has not been completely solved. Price indexes can be applied to original cost to convert it to current cost but, as yet, how can the accountant differentiate as to the higher cost of new equipment, between that which signifies product improvement and that which represents shrinking purchasing value of the dollar. For instance, to take an example familiar to almost everyone, how much of the increased price of an automobile is due to the cost of refinements, and improvements and how much can be attributed to inflation? Perhaps we need another postulate which might run, "Product improvement is a natural benefit that modern competitive business bestows on civilization without higher cost."

The second postulate remains possibly the most axiomatic of the three. Accountants can hardly escape the fact that their figures must be based on the assumption that liquidation, which would reveal a final and definite profit or loss, is not in sight and, hence, estimates of the residual amounts or values representing the situation of a business enterprise must be used and accepted in the periodic financial statements.

The third postulate, while still necessary in many instances, is, of course, properly qualified as above by the word "usually." In revenue-producing sales, the postulate of completed transactions is generally observed. The practice of recording income on a percentage of completion for long-term contracts is an apparent departure but can be rationalized by assuming that contract provisions for partial billings separate the contract into a series of completed transactions. In many other transactions, however, this postulate cannot be applied. Depreciation practices are a direct contradiction and inventory valuation adjustments, bad debt provisions, etc. certainly are not in accord with the basis of recording profit or loss only on a completed transaction.

A New Realization—And What to Do About It

This discussion of accounting fallacies and postulates should not be accepted as an admission of weakness, yet it should encourage a program of education and development. To sum up the avenues along which this development should run, I believe accountants should adopt this program:

1. *Come to full realization of the existence of accounting's limitations*—The accountant must examine closely the accounting reports and figures issued, for the limitations which attach themselves when the results of a business enterprise are expressed in dollars and cents.
2. *Inform those using accounting reports*—It is important that accounting reports and figures be presented in such a manner that business managers, stockholders, etc. understand the limitations and postulates under which the accountant operates.
3. *Improve accounting methods*—The accountant must continue to improve his techniques and methods. Although there are many points at which full accuracy cannot be attained or is unnecessary, there are also many areas in which accuracy must be maintained. Much attention must be given to the matter of judging when an exact figure is possible and must be supplied and when, on the other hand, an exact figure is either impossible or impracticable. One very important point often overlooked by accountants is the attention necessary to obtain accurate source material. No sequence of complex mathematical computations will ever correct a figure which is incorrect by reason of its origin.
4. *Develop new methods*—The accountant should continue to explore new approaches to accounting such as have been developed in recent years to increase service to management. Among these developments, to name a few, are standard costs, direct costing, realistic depreciation practices, projected financial statements, and budgeting.

Let us accept the fact that accountant and all those who use accounting reports and figures, must understand the degree of estimate and approximation in them and come to the realization that they have limitations. When a new auto model is issued, the designer does not know whether or not the public will accept it. The production manager can only be sure that, in spite of rigid inspection and precautions, some of the autos will break down. A movie producer is never quite sure whether or not he has a success on his hands. An attorney can never be sure that he is going to win his case. There are like uncertainties in accounting and its products. I once heard accounting defined as a process of being excruciatingly exact about a lot of arbitrary assumptions. Well, let us admit the "arbitrary assumptions" but let us drop all pretense of being "excruciatingly exact" in the results.

Obtaining Benefits of Both Direct and Standard Costing in a Furniture Factory

by LEONARD HEIMANN and RICHARD S. ROSENBLOOM

THE HISTORY OF THE BERKLINE CORPORATION is characteristic of the development of its industry in general. Starting more than 15 years ago in an empty garage, the company now occupies approximately 200,000 square feet of manufacturing space and employs more than 600 production workers. During such a period of rapid expansion, there usually comes a time when the internal organization is no longer adequate for the size of the operations. Berkline reached this point in 1954 when the existing accounting procedures failed to give satisfactory answers to a number of important questions. Management decided to call in outside consultants and give them the job of installing an up to date accounting system.

For a background, let us say that Berkline manufactures upholstered chairs and ottomans. There is a limited number of basic styles in the line. Each, however, can be made up in many variations. The same frame, for instance, can be assembled as a stationary chair, as a rocker, or as a swivel, with spring construction or rubber cushions, and it can be covered in an unlimited number of patterns and colors. The distribution is nation-wide and entirely through company salesmen.

Before going into the details of the methods and procedures used, let us briefly review the results of the installation. The new cost system enables management to:

1. *Forecast* costs and profitability and therefore to—
   a. Appraise the value of new products and of products already in the line.
   b. Plan for profits on a company-wide basis.
   c. Evaluate the effects on profits of volume, price, and cost changes and trends.
2. *Compare* actual costs with standard costs and, therefore, to—
   a. Pinpoint the location of excessive costs and take appropriate actions.

LEONARD HEIMANN (Springfield Chapter, 1944), is Controller of the Berkline Corporation, Morristown, Tennessee. He has been affiliated with this company since 1941. Prior to this he held the position of Budget Director of the Anhaltische Kohlenwerke A. G., in Germany. RICHARD S. ROSENBLOOM is a graduate of Harvard College and Harvard Business School. At the present time, Mr. Rosenbloom is an Instructor at the Harvard Graduate School of Business Administration.

b. Point out individual performances for praise or question.
c. Control consumption of material.

3. *Control* selling effort on the basis of profits and therefore to—
   a. Emphasize the more profitable products in selling.
   b. Evaluate the performance of individual salesmen on the basis of their contribution to profits.

The system used to give Berkline these results is called basic costs. It is a combination of direct costing principles with standards and controls developed for conventional standard costs with flexible budgets. In direct costs the separation between fixed and variable expenses is maintained in all reports. Fixed costs of production are not charged into inventory but, instead, are directly charged as a deduction from profit for the period in which they were incurred. The operation of this standard cost system includes three somewhat independent phases of activity, which form the main subdivisions of this article. They are:

1. Planning standards and budgets.
2. Collecting data on actual performances.
3. Summarizing and evaluating the performance figures.

The Planning Phase: Standards and Budgets

The first step in the installation of a standard cost system is setting the standards for quantity and price elements:

1. Engineered standards for direct labor hours and for the quantity of all direct materials used.
2. Forecast of the labor rates and of the delivered prices of materials and supplies.

In the furniture industry, the pricing of covers presents special difficulties. Basically, covers are graded according to their costs. However, the market value of a cover does not necessarily coincide with its cost and is subject to frequent and sudden changes. Therefore, the company is grading covers not according to their actual costs but, rather, according to their estimated market value. Hence, the standard material price for cover is merely the standard cost for the grade in which it is expected to be sold.

Prior to the preparation of expense budgets, the volume of the production for the budget period has to be estimated. In the upholstered furniture industry, it is not practical to work out a detailed sales forecast, style by style, for any length of time. However, for budgetary purposes, it was found satisfactory to

estimate the overall unit volume by product lines and classes of customers. These figures then become the standard volume for the budget period.

The plant is broken down into 20 cost centers or departments, and, for each one, a unit of departmental activity is specified. In the lumber yard and the dry kilns, activity is measured in board feet of lumber; for the majority of the frame shop and the upholstery operations, standard allowed labor hours are used; for shipping department, units shipped; for the truck fleet, miles traveled, etc. For each, the company's standard volume has to be translated into activity units. The departmental activity forecast then becomes the standard for which the expense budget can be developed. The conventional methods for determining both the character and the rate of expense are followed throughout. The aim is an achievable budget, subscribing neither to ideals which are unrealistic nor to excessive allowances in order to show a good performance.

This budget procedure is carried out for each cost center, productive and service, and for each expense account. For the productive departments, the total of labor and expense is entered on a budget sheet, broken down into its fixed and variable portion. For service departments, the total expenses are also posted to a budget sheet and then distributed to the productive departments. Various bases are being used for the distribution. Some of the general factory expenses, for example, are pro-rated according to the square foot area, others according to the number of employees, payroll dollars, etc. These pro-rated service department expenses are entered on the budget sheets for the productive departments. From the total expenses (direct and pro-rated) of the productive departments, two rates are finally developed for the department's activity unit, one for fixed expenses and one for all variable expenses including direct labor. These rates are calculated by dividing the budgeted expense (fixed or variable) for the period by the standard activity.

The Planning Phase: Product Cost Development

There are more than 500 different frame parts or upholstered subassemblies. For each of these, a parts card is prepared. The material quantities are taken from the specification sheets of the engineering department, a percentage loss is added and the gross quantity is extended by the standard material price. Note, however, that the cost of the cover is not shown on any of the part cards; it is carried forward directly to the standard cost summary for the finished product where both the yardage and the price per yard are listed as separate items. Standard allowed labor hours for each operation and each component part are again taken from lists prepared by the engineering department. The standard time is multiplied by the variable costing rate, as shown on the budget sheet

for the pertinent department. The result is a figure for the variable portion of direct labor and expense for each part. Although the company calculates a rate for fixed expenses within each department, it is not carried forward into the product costs.

To summarize the cost of each style, the component part cards are posted to standard cost summary sheets, subdivided into material cost and variable labor and expense. By adding up the costs of all component parts, we get the variable cost of manufacturing. However, in order to show the total variable cost, not only of producing, but also of selling and shipping the merchandise, three more figures have to be added:

1. The cost of wrapping, packing and shipping, based on the standards for the specific method of shipping planned.
2. Commissions, royalties and discounts calculated as a percentage of the sales price.
3. A fixed amount per unit sold added to the material cost as an inventory adjustment (explained in a later paragraph).

Variable manufacturing expense, plus wrapping and shipping, plus commissions and discounts, plus inventory adjustment, adds up to total variable cost of goods sold. When this is deducted from the selling price, there remains a balance called "profit contribution," probably the most important single figure in the whole cost system. It represents the amount available for absorbing the fixed expenses and providing a profit. It is customary with this type of accounting to express this profit contribution as a percentage of the selling price and call it profit/volume ratio. However, we believe that, in the upholstered furniture industry, this ratio is of limited value. It cannot be used for pricing new products or for comparing the relative profitability of existing styles, for the following reasons:

1. It does not fit into the traditional pattern of the industry, which is to "mark up" materials much less than labor and expense.
2. It is not related to the productive capacity of the plant, and Berkline has been operating at capacity for some time.

To overcome these difficulties, Berkline has developed a "conversion mark-up" formula. A fixed percentage of material costs is assumed to be the mark-up on materials, including inventory adjustment, and that amount is deducted from the profit contribution. (As will be explained later, this mark-up on materials is such as to give Berkline a fair return on the funds invested in inventories.) The conversion mark-up is, in effect, the mark-up on all variable expenses except materials. Dividing it by the variable manufacturing and shipping labor

and expense yields the conversion mark-up ratio. This is the ratio Berkline is using for pricing purposes and for determining the relative importance of various products to overall company profits.

Nearly every basic style in Berkline's line is being offered for sale in eleven or more cover grades. Detailed standard cost summary sheets are usually figured for the lowest cover grade only. To maintain the necessary flexibility without too much paper work, a definite procedure has been established. All cost summary sheets figured in base Grade 1 show the conversion mark-up ratio for both base Grades 1 and 11 grade covers. Assuming, for example, that a certain style has a ratio of 50 per cent in Grade 1 cover, and of 80 per cent in Grade 11 cover, it would appear that, per cover grade, the conversion mark-up ratio increases 3 per cent.

At time of sale all figures necessary for pricing inventories and for costing sales are readily available from the standard cost summary sheets. The standard cost of manufacturing and shipping includes all variable expenses for productive departments (including pro-rated expenses of service departments), plus the variable expenses for wrapping, packing and shipping. The cost of the cover is again handled as a separate item and is calculated by multiplying the standard yardage for the particular style by the standard cost of the actual cover grade in which the chair is sold. Obviously, this cannot be added in before the time of sale. As Berkline has neither a goods-in process nor a finished goods account, none of the steps outlined above has to be duplicated. There is just *one* inventory account, which is charged for all direct materials at standard price when purchased plus all direct labor and variable factory expenses at standard when the goods are produced, and which is credited for the standard cost of manufacturing and shipping when the goods are sold.

There is a great amount of clerical work involved in preparing the lists used to compute the standard variable cost of sales. First of all, one group of tables has to show the standard variable cost of manufacturing and shipping, less cover, for each style. Besides the basic style, each of ten possible variations has to be considered. In addition, because of a difference in manufacturing labor required, the manufacturing and shipping cost, less cover, must be figured for each style, both covered in plastic and covered in fabric. A second group of tables presents the standard material cost of the cover, tabulated by cover grade and chair style. Three separate calculations have to be made—one for fabric in regular construction, one for fabric in conjunction with rubber seats (the yardage differs slightly), and one for plastic. Finally, these two groups of tables have to be combined into one, in order to facilitate the routine of the costing procedure.

Bringing Planning to a Head in the Forecast

After estimating the volume for the budget period, establishing departmental expense budget and figuring product costs, we are now ready to bring the planning process to its conclusion with the profit forecast. Its preparation is simply the process of putting all the available figures into their logical sequence; sales minus variable manufacturing, shipping, and selling costs at standard equal standard profit contribution, and standard profit contribution minus total standard fixed cost equal standard operating profit. These forecasts have to be worked out separately for the various classes of customers. Fixed expenses are allocated to these various groups according to the unit volume anticipated for the budget period.

Collection and Recording of Cost Data

In the preceding paragraphs, the establishment of company objectives has been described. We now have to describe the procedures followed to collect actual costs of operations. First, materials and supplies are divided into two groups—inventory and expense items. There are two material price variance accounts, one for covers only and the other for all other inventory items. Inventory items which are not direct materials are charged into cost when they are withdrawn from the stockroom on the basis of requisitioning sheets. All bills for expense items are marked by the purchasing department with the number of the cost center which requested the purchase. The cost clerk enters it in his cost ledger accordingly. Secondly, as to labor, each worker is classified according to his regular department and appropriate expense account. As part of the routine payroll procedure, a weekly payroll summary sheet is prepared distributing all wages paid among the various cost centers and expense accounts.

With respect to activity for each department, the engineering section keeps a daily record. A monthly summary sheet shows both the budgeted and the actual activity expressed in the units appropriate for the cost center. For lumber yard and dry kilns, actual board footings received in the yard and placed into the kilns is used. For the rough mill and parts machining departments, standard allowed labor hours are computed from the receipts of frame parts into intermediate storage. Activity for the remaining productive departments is calculated in standard allowed labor hours, either on the basis of piece-work tickets giving the unit production by chair style, or by converting total piecework wages paid directly into standard allowed labor hours without style breakdown.

Analyzing Operating Results

The monthly profit and loss statement summarizes and reconciles budgets and standards with actual operating performances. The figures for both the month and the year to date are shown, analyzed by classes of customers. Sales are shown in both units and dollars. To arrive at the standard cost of sales, two amounts have to be entered, first, the variable cost of manufacturing and shipping at standard, computed from the tables already described before and, second, the standard selling cost derived as a fixed percentage on sales. Next on the statement are the variances from standard costs of sales, which will be discussed separately below. Standard variable cost of sales plus and minus variances from standards give the actual variable cost of sales. This, deducted from actual net sales shows the profit contribution (total amount, profit volume ratio, and profit contribution per unit.) All are broken down by sales classifications. Fixed expenses are shown as a standard, plus and minus variance and total actual amount, while profit figures are recorded at actual only. For the reconciliation of actual profits with planned profits, a separate report is made monthly. This analysis is fairly simple, dividing the variance from profit into three groups according to executive responsibility: (1) sales (2) variable cost of sales and (3) fixed expenses. Under sales, the sales volume variance and the sales price variance are shown separately; the cost of sales variance consist of the material price variance, the material usage variance, the variable labor and expense variance and, finally, the inventory adjustment.

The variance accounts represent means for cost control and tools for cost production. Raw materials represent approximately half of total cost. To reflect the price fluctuation in material purchased, there is one material price variance account for covers and one for all other materials. The standard entries into these accounts have been discussed previously.

However, for the productive departments of a furniture factory, the material usage variances are of even greater importance than the material price variances. Three usage variances have been developed: (1) frame shop materials (2) cotton and (3) cover. The frame shop usage variance covers three cost centers, roughing mill, chip craft, and parts machining, and measures the difference between input and output. Input is the lumber withdrawn from the kiln, including the standard labor and expense it has picked up in the lumber yard, in the dry kiln, and in the three frame shop departments listed above. Output is calculated from the standards for frame parts received into intermediate storage. The difference is expressed in a dollar amount for material, for labor and ex-

pense, and for the total of the two. In addition, a lumber usage variance report in board feet is prepared by the engineering department.

To calculate the usage of cotton, the standard allowed poundage is taken from the production statistics by chair styles. The perpetual inventory records show the quantity withdrawn from the stockroom. Usage is the difference between these two figures priced at standard. Actual cover usage is not recorded at this time. However, a record is kept of cover being used for other than productive purposes as, for instance, repairs, making samples, etc. In these cases, the cover-cutting department submits a special report called "cover cut without order," which is being used to reconcile the perpetual inventory records and which, on the statement, is shown as "cover usage variance."

There is, however, a more serious problem involved in the pricing of covers. Every six months a physical inventory is taken and at that time, all covers have to be priced according to their market or selling value, regardless of original cost. The market value is, of course, determined by subjective appraisal. After a period of time, as fashion changes, the value of a cover pattern may depreciate. Anticipating those cover write-downs, as well as any normal obsolescence or shrinkage of supplies, Berkline charges its costs monthly with a reserve for inventory adjustment figured as a fixed dollar amount per unit sold. As noted earlier, this inventory adjustment is included in the product cost summaries.

As far as the efficiency of the plant operation is concerned, the most important figures are the variances on labor and expense. They are arrived at in the following manner. For each department for which a budget has been established, a monthly cost and variance statement is prepared. Three figures have to be entered, both for the month and for year to date:

1. The budget allowance which, since the budgets are flexible, is based on actual departmental activity.
2. The actual expense as recorded in the cost ledger.
3. The variance between the two.

The cost and variance statements are set up according to supervisory responsibility and include both fixed and variable expenses. A detailed work sheet called "summary of manufacturing labor and expense" is being used to develop the necessary bookkeeping entries. The standard variable labor and expense of all items produced is charged into inventory, the current allowance on fixed cost is debited directly to profit and loss and the variances from both are shown separately on the statements.

Marketing

Standard product costs are the most important cost information used in marketing decisions. In upholstered furniture, however, competitive market conditions rather than manufacturing costs are the primary determinants of selling prices. In general, the pricing procedure involves finding the retail price at which the chair can be sold and setting the factory price at a level which will allow a reasonable margin to the retailer. Product costs, therefore, serve only as a reference point to determine the profitability of the item at the proposed price. If the initial price will not give a satisfactory margin, changes may be made in price, construction, manufacturing methods, or the product may be dropped. We feel that the dollar profit contribution and the conversion mark up ratios developed for each product represent excellent tools for such marketing decisions.

As far as conditions permit, the company is trying to influence the mix of products sold so as to show the greatest possible profits. The efforts to promote selective selling are based on a list, ranking all products by their conversion mark-up. This list is passed on to the salesmen for their guidance.

In order to measure the performance of salesmen, two monthly statistics are kept on a six months' cumulative basis. First, each man's unit shipments by basic styles are tabulated and accumulated. Second, the profit contribution for each man is figured, based on his actual sales and on standard cost of manufacturing, shipping and selling, with the exception of commissions, for which actual costs rather than standards are used. The resulting report gives the following data: unit shipments, dollar sales, cost of sales, total profit contribution, and profit contribution per unit sold. It then shows the relative standing of each man according to sales amount and profit contribution per unit. In many instances, it is found that a man who ranks first in units shipped or in dollar sales, stands lower in the ranking by total dollar profit contribution per unit.

Planning Ahead for Profit

An important goal for any business is to maximize profits. Berkline feels that success or failure of a manufacturing unit can be measured best by analyzing the return on total assets employed. This method eliminates completely any consideration as to the manner in which the total assets are financed, whether by banks, other creditors, or stockholders. The company's consultants prepared an interesting study of the return on total assets employed in leading industrial companies. Berkline has established a profit goal that is in line with the findings of this report.

In order to translate the profit goal into usable operating figures, a profit and loss statement is projected showing desired sales, variable cost of sales,

profit contribution, and fixed expenses, analyzed by sales classification. The statement also shows the amount of the total assets and allocates them to the various classes of customers. Total assets are distributed to these groups in the same manner as fixed expenses, i.e., according to the anticipated unit volume. (At this point, we might explain that the profit picture varies widely within the various sales classifications. In order to contribute its proper share to the overall profit goal of the company, each group has to meet its own objectives.) It is then a matter of simple arithmetic to figure the conversion mark-up ratios required to produce the desired profit. Take the fixed mark-up percentage on the cost of all materials, including inventory adjustment. Deduct this amount from the profit contribution. Lastly, divide the remaining balance into the variable manufacturing labor and expense.

The fixed mark-up on materials is calculated to provide a satisfactory return on the investment, even in times when the turnover may be comparatively low. Under normal conditions, the return on the investment in inventories should be higher than the average return on total assets.

Conversion mark-up ratios and returns on gross assets can also be developed for the profit forecast, which was previously described as the estimate based on realistic standards and budgets. Further points of reference are established by working out profit and loss statements for the break-even volume, the break-even costs, the break-even prices or for any other condition which might be of interest. Tables and charts are worked out to summarize these calculations by showing the company profits broken down by sales classifications, the conversion mark-up ratios, and the profit volume ratios related to them and, finally, the return on total assets at each of these levels.

Providing Decision Data

We believe that Berkline's cost system furnishes the basic data necessary to operate a manufacturing establishment. The relationships between prices, costs, volume, and profits are clear and easy to understand. The figures enable the top executives of the company to establish the profit goal and to direct the efforts of the whole organization toward its achievement.

Let us remember, however, that people, not systems, control costs. In the final analysis, costs can be reduced only by the individuals, whether vice president or foreman, who has direct responsibility for spending the money. A good cost accounting system can only provide useful information to those whose job it is to make decisions. Its effectiveness depends on getting the right data to the right man at the right time. A cost accounting system is justified only when top management realizes that cost data are there to be used in making decisions.

ACCOUNTING PRINCIPLES FOLLOW STATEMENT USES

by Chauncey A. Norton*

IN DISCUSSIONS among accountants and businessmen we frequently hear complaints that financial reports prepared in accordance with generally accepted accounting principles do not always present financial information in the most useful or informative fashion. The business manager, very often, is as much interested in what should have happened as in what did happen. Even those accountants who are most vehemently opposed to drastic revisions of generally accepted accounting principles will concede that these complaints often have a certain validity. These apparent conflicts would be less troublesome, perhaps, if we would bear in mind the difference in the purposes to be served by the various concepts and the responsibilities of the persons preparing or using the information.

Financial statements in the conventional form usually are prepared for the use not only of management but also of creditors and investors. These outside users should receive statements prepared in a manner which will enable them to form their own judgments without being colored by the viewpoint of management, insofar as this is possible. The most widely used technique in forming such judgments is that of comparison with other businesses or with composite data for industry groups. If this technique is to be effective, it is essential that the information presented by one business be prepared in a manner and in accordance with general principles that are broadly comparable with those followed by others. Since it is very difficult to accomplish basic changes in the application of generally accepted accounting principles quickly and uniformly, and since the advantages of consistency and comparability, in the opinion of accountants, may outweigh other considerations, accountants generally are reluctant to abandon basic principles of long standing.

It should not be inferred from the foregoing that it is improper for management or accountants to communicate their own judgments or interpretations. This, I believe, is one of the functions of efficient management and certainly of professional accountants, but it is an auxiliary rather than a primary function. Creditors and investors will and should welcome such interpretations as additional information supplement-

* Partner, Haskins & Sells, Detroit, Michigan.

ing the reports and presented in such a way that the reader's objective analysis is not diverted.

The business manager, thinking of internal management only, is not subjected to the restraints imposed by responsibilities to persons outside the management organization. In reporting to creditors and investors, his responsibility is similar to that of the accountant but, in strictly internal affairs, he may completely disregard the "generally accepted" concepts if, in his opinion, this will result in getting information that is more useful to him in his job of managing the enterprise.

The complaints and criticisms which often arise in this area would be eliminated, or at least greatly minimized, if everyone understood that the various viewpoints are not irreconcilable. It is even possible to accomplish the various objectives within the framework of the same accounting system. Whether this is desirable will depend on the circumstances in each situation or, in many instances, on the personal preferences of the persons involved. Such techniques as direct costing and replacement cost depreciation have been proven to be valuable and useful for industrial management and control. Every successful business manager uses them to some degree. Some have developed highly formalized techniques for their employment, some use a more informal supplemental approach, and some follow a "seat-of-the-pants," or intuitive, means of applying them. Breakeven analyses, however primitive, represent the application of direct costing to some extent. Continuity of a business enterprise requires that a portion of its gross income be utilized for replacement of facilities. All businessmen give consideration to these factors by some means or other.

The two techniques mentioned have not yet become generally accepted as accounting principles. Until they do, neither accountants nor business managers will be fulfilling their trust if they employ them for financial reporting for general use. On the other hand, if management finds these techniques, or others in the same category, useful for management purposes, the accountant who fails to provide the necessary information for their use is not giving full value to the business which employs him. The conscientious accountant, in fact, will, on his own initiative, provide the data and instruct his management in their interpretation and use.

These comments are not intended either as a defense of generally accepted accounting

(*Continued on page* 90)

Enterprise Operating Cycle As the Planning Basis for Fund Flows

by COLIN PARK

HAVING NO QUARREL with the very good reasons for using year periods for financial income reports, my objective here is to try to show how vital figures for appraising business activities can be developed when time periods used for these analyses are related to enterprise operating cycles. Keeping the following in mind will be helpful in this discussion:

1. The analyses presented are intended primarily for management's internal use.
2. This study concentrates on fund-flows. Cash-flow is a vital component of total fund-flow, but we shall deal here with the larger problems of measuring fund movement.
3. Meaningful fund planning during inflation forces substitution of replacement costs for historical costs, but detailed expansion on this point is not necessary to the objective of this article.
4. The operating-cycle periods to which this study is oriented are those multiples of months approximating the time-periods covered by completion of these events:
   a. Starting with free capital in the form of cash and credit, investment in materials, manpower, and other services takes place.
   b. Production.
   c. Storing finished product. This terminates at the point of selling finished product.
   d. Accounts-receivable collection period which results in, and terminates at the point of, disinvestment into new free capital.

Adapting enterprise financial figures to the time criteria of operating-cycles, detailed under Point 4 above, takes into account several important factors neglected in customary funds analyses. Because the pace of business changes during the course of a year, flow time is distorted when the figures relate to static calendar periods, such as the year. When the term "current" relates to a calendar year of operations but free capital investment-disinvestment cycles are more or less than a year, working capital estimates do not dependably reflect the net fund of purchasing power available for productive commitment to enter-

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COLIN PARK (Buffalo Chapter, 1952), is Partner, Haskins & Sells, Buffalo, New York. Mr. Park is a former contributor to the *Bulletin*.

prise operations. Furthermore, the unique activities of each business entity suggest individual needs for tailor-made funds analyses. It should be pointed out that this may be so *within* as well as *among* companies. A single division of a multi-product company can have fund-planning problems quite different from those of the company as a whole.

Funds Flow Statements to the Fore?

Something else that hobbles customary funds analyses is the approach that produces fund-flow figures as derivatives of cost-revenue matching in the income determination process. These hand-me-down fund-flow figures could scarcely be expected to have the time-function relevance that figures designed specifically for funds statement use might have. This leads to the thought that revenue-expense recognition might perhaps gain realism if, as a switch, *they* became the derivative figures. Income figures are, after all, the scoreboard results of management's fund strategy.

There are some rather good reasons for predicting growth in businessmen's use of funds-flow presentations. Financial management deals with fluctuations in available working capital and this is what funds statements aim to trace. Also, realism in reporting financial activities to the decision-maker seems more likely of attainment through this medium for what the accountant depicts must square with something close to management's financial experience. He must be especially analytical and thoughtful in funds-statement preparation. Funds-statement users are in a better position to say whether the statement is meaningful or not, than are many of the users of other principal types of financial statements.

The growing importance of funds-flow analyses to businessmen, already noted, prompts one to ponder this question. This development would seem an entirely natural one. As a matter of mechanics, the raw material for constructing a funds statement comes from related income and position statements. If the funds statement came to be regarded as being the most-meaningful statement for financial analysis and the income statement were to be down-graded, as has been the case with the position statement, accounting in terms of fund-flows surely would assume preeminence. Perhaps, also, this development would bring with it the conditions under which it would be necessary and feasible to introduce into the accounting model replacement, price-converted, and other valuations having greater relevance to funds measurement and movement.

What the Change to Operating Cycle Signifies

Before exploring further ways to frame funds-flow statements for operating time cycles, let us look at a greatly simplified example of traditional recording technique. The figures used in this example will be converted to new forms in later examples to facilitate comparison and appraisal of the results obtained. Naka Corp., a fictitious calendar-year corporation, has these summary figures for the four months (its operating-cycle as measured currently) from May 1 to August 31, 1957 (000s omitted throughout). The customary income-determination entries and their summary in the accounts are illustrated in Exhibit 1.

CUSTOMARY HANDLING OF ENTRIES

Income - determination Entries

	Dr.	Cr.
a. Net asset exchanges...	130	
Net asset exchanges...		130
b. Net Asset increases	400	
Revenue recognized		400
c. Expense recognized..	250	
Net asset decreases ..		250
d. Revenue tally for period	400	
Expense tally for period		250
Earnings measurements for period		250
e. Distribution to owners	125	
Net assets decreased...		125

Accounts Summary

			Transactions		
	Entry	Begin	Dr.	Cr.	End
Net assets.....	a	600	130	130	
	b, c		400	250	
	d			125	625
Revenue	b, d	0	400	400	0
Expense	c, d	0	250	250	0
Owners' equity.	d, e.	600	125	150	625

EXHIBIT 1

In order to develop the entries shown, a change in time period application of something accountants already do is practically all that is necessary. Instead of concentrating on allocation of associated expenses and revenues in annual income determinations, the emphasis would be on fund-flows relevant to operating-cycle periods (the lengths of which vary from time to time during the year). Current assets and liabilities would be those moving in the stream of real fund-flows during the currently-existing operating-cycle. Non-current services and obligations would be those maturing at times beyond the current operating-cycle. Thus, in the present example, customers' accounts thought to be collectible in less than a year, but not within four months would be classed as non-current. The subdivided entry might appear as follows:

	Total			Non-
	Dr.	Cr.	Current	current
Accounts receivable	400		340	60
Sales revenue		400	340*	60*

With a reminder that we are dealing with analytical figures for internal use by management, several notions emerge:

1. Slanting one's interest to operating-cycle fund-flows forces recognition of the current and non-current elements of *all* assets and liabilities.
2. Allocation of net asset contributions to future operating periods necessitates changing the amounts set as current and non-current (1) as the length of the operating-cycle used in the analysis changes and (2) as experience alters estimates as to the portions allocable to past and future (for example, "fully depreciated" machinery still in use would have to be partly "undepreciated" for this analysis).
3. This approach could bring the timing of revenue recognition into sharper focus, giving greater meaning to the important realization concept. (For example, should a sale to a customer who gives a 13-month note be included in current income? In the compromise technique of the present analysis it would at least be classed as non-current, though currently recognized, revenue.)
4. The analysis concentrates on thinking toward the future rather than the past—a desirable approach surely, because of the links between performance and planning data established for forecasting. Past-performance measurements can become more realistic in the process.

With these ideas in mind, the schematic Naka Corp. entries and their summarization in the accounts might appear as in Exhibit 2.

Note that tacked-on to the accounts presentation is an analysis of sources of new capital required for Naka Corp.'s forthcoming operations. This is one example of the opportunities for linkage of past-performance to planning data that this approach and presentation make possible.

Discussion of the details underlying the tabulations in Exhibit 2 is not attempted here, for our objective has been only to suggest fundamentals of approach and the general shape that the results might take. The examples given are fairly "tricky" because they are generalized; they do not take detailed, familiar forms. This is intentional for our approach is to the idea, not specifically to its technical development. It would be ineffectual to try to justify the idea through a mechanical argument. If the notions advanced here have merit, the resulting practical implementation may appear meaningful.

The incentive for this research approach is a belief that accountancy in its present form holds many undeveloped opportunities for gleaning information vital to managerial decision-making. It is not necessary to abandon present structure when so much can be accomplished by building on present structure. We can exploit these opportunities by recognizing that productive research must of necessity be divergent from existing practice. Even if new and better ways of

FUND-FLOW ANALYSIS ENTRIES

	Total Dr.	Cr.	In relation to operating cycle: Current	Non-Current
a. Net asset exchanges	130		100	30
Net asset exchanges		130	110•	20•
b. Net asset increases	400		340	60
Revenue recognized		400	340•	60•
c. Expense recognized	250		225	25
Net asset decreases		250	225•	25•
d. Revenue tally for period	400		340	60
Expense tally for period		250	225•	25•
Earning measurement for period		150	115•	35•
e. Distribution to owners	125		125	0
Net assets decreased		125	115•	10•

Accounts summary

	Entry	Total	In relation to operating cycle: Current	Non-Current
Net Assets:				
Begin		600	400	200
	a	130	100	30
	a	130•	110•	20•
	b	400	340	60
	c	250•	225•	25•
	e	125•	115•	10•
End: result of current period operations, see below		625	390	235
Owners Equity:				
Begin		600•	400•	200•
	d(b, c)	150•	115•	35•
	e	125	125	0
End: result of current period operations, as above		625•	390•	235•
Capital required for forthcoming operations:				
Free Capital			375•	
Capital for existing and planned investment in long-life services				335•
Total capital required		710•		
New capital required		85•	15	100•
Sources of new capital:				
Amount available from current operations			15	15•
Additional capital to be provided:				
by sale of capital stock				50•
by long-term bank loan				35•
Total		85•		
		85•	15	100•

EXHIBIT 2

doing things are not discovered, established methods may be improved in the creative process made possible by assuming that those methods might not be all they are "cracked up to be."

In the subject area at hand, disappointments experienced with conventional "working capital" strongly support a contention that accountants ought to produce more meaningful estimates of the free capital available for commitment to productive operation by management. That is what is proposed here.

A New Barometer to Interpret Fund Flows

Using some of the same figures for fictitious Naka Corp., let us look next at one kind of funds statements that can be produced from these figures. While, in this case, historical figures for the same operating-cycle period as before, four months ended August 31, 1957, are presented, it is suggested that a funds statement in the form shown in Exhibit 3 would be rather useful in fund planning, especially if the forecasts were tied-in realistically to preceding historical tabulations in the same form. A highlight of this statement is its *indicated shift of funds* during the period analyzed. Here is a new financial barometer capable of giving top-management an idea of how, in the aggregate, operating management is carrying out a financial policy.

Naka Corp.
Funds Flow Analysis
Operating Cycle May 1 to August 31, 1957

	Total	Current	Non-current
Historical net assets, begin:			
Free capital		$400	
Sunk capital			$200
Total capital	$600		
	$600	$400	$200
Funds provided:			
By operations, after adjustment for non-cash charges against income	$310	$240	$ 70
Proceeds from additional capital stock issued	100	65	35
Proceeds from sale of old machinery	5		5
	$415	$305	$110
Funds applied:			
For purchase of new long-life services:			
Buildings	$ 10		$ 10
Machinery	20		20
For payment of federal income taxes	140	$140	
For repayment of bank loans	20	10	10
For retirement of bonds	200	150	50
	$390	$300	$ 90
Net fund-inflows for period	$ 25	$ 5	$ 20
Indicated shift in short- and long-term capital allocation during period	-	15*	15
Direction of shift		→	
Planned allocation to forthcoming operations of presently-held net assets:			
Free capital		$390	
Sunk capital			$235
Total capital	$625		
	$625	$390	$235

EXHIBIT 3

In the Naka Corp. case, the directors might have instructed management in the spring of 1957 as follows: "For a few months, in spite of the necessity to pay off our bond obligation, work toward keeping the company liquid because we want to go into a program of plant modernization and expansion this autumn." Considering the fact that $200 thousand of bonds payable were eliminated during the period, it is indicated that the company officers were able to comply. The slight shift in capital allocation away from being current would have been a most significant shift in the opposite direction but for the bond repayment.

Assuming the reliability of the four-month time-criterion used in creating the illustrated Naka Corp. figures, it follows that conventional "working capital" figures (total cash, receivables, inventories, prepayments, etc. minus total payables, payrolls, etc.) based on one-year currentness could not give as dependable an indication of the results obtained. With this argument in mind and in order to make a clear distinction between what accountants mean by working capital and the figures developed here, the economists' term, "free capital" is used. That term and its complement in total capital, "sunk capital", deserve greater use by accountants—but only if what is portrayed beside these captions is relevant because the figures are oriented to dynamic operating-time functions.

For Better Management Handling of Free and Freed Capital

As Marquis G. Eaton wrote recently, "Financial reporting is simply the expression in terms of a common denominator of the whole complex network of elements which make up a business—land, buildings and machinery, raw materials, people at work, interrelated legal obligations—and, most important, the results which they produce."[1] For financial reporting to stockholders, for income taxation, and for many other purposes, static calendar periods present the best alernative for a common time denominator. But for creating meaningful figures to aid management in handling the strategy of free-capital investment and disinvestment, dynamic time denominators are needed. The operating cycles of a business are time-functions that can be used in developing such figures. Research into this neglected area of accountancy's general concepts surely would be fruitful.

[1] Marquis G. Eaton, "Financial Reporting for a Changing Society," *The Journal of Accountancy*, August 1957, p. 25.

A NEEDED RECORDS PROGRAM—by J. Warren Bishop*

For many years our office building was much like a roomy old house with plenty of closets and a large attic. With steady expansion, the need for more room became apparent several years ago and plans were started for a new adjoining building. By the time the foundations for the new building were in place, the "closets" were converted to offices and the "attic" was bulging. One expedient to meet our needs for more economical use of existing space was to put into existence a program for the orderly destruction of unnecessary records and the orderly safe-keeping of others. Space requirements were obviously not the only reason for such a move toward more systematic housekeeping. However, they served to touch the needed spark to the incinerator.

The first step, as is so often the case, was the formation of a committee. As is less often the case, each committee member was there for a purpose: attorney, corporation secretary, controller, tabulating methods supervisor, central files supervisor and two methods men to assemble material and carry out the committee's decisions. The first few meetings involved a study of the problem—mapping areas used for inactive storage, inventorying their contents, reviewing programs in use in similar companies, studying legal requirements, etc.

Under some pressure from our architects to clear some basement storage areas for additions to heating, electrical and telephone equipment, it was decided that a few bulky items should be tackled first. The incinerator did a heavy business with books and boxes of invoices dating back from twenty to a hundred years. Samples were given to (and received with thanks by) the local historical society. Our methods men visited each department and brought before the committee a list with samples of types of records filed, with departmental recommendations for periods of active and ultimate storage. With the assistance of the department head, the list was reviewed by the committee and put in final approved form.

Our present system includes a records manual which starts with some basic statements of policy and description of procedures. For each major department it includes a list of the types of records prepared, with fixed periods for department retention and inactive storage, and remarks as applicable. Our basement is now divided into areas of dead storage and semi-active storage from which records can be provided on 30-minute call by a full-time attendant. A two-part form is prepared for each standard sized box sent to basement storage: one part is pasted on the box showing description and destruction date; the other is posted to a record card which is filed by subject and retention period as the attendant's guide to location. A standard form records the approval of destruction of listed items and is later signed and dated when destruction takes place.

Our program has had many useful results, some planned and some coming as by-products.

1. We know where old records are and can get them easily.
2. We have a record of what has been destroyed.
3. We have eliminated much duplication of filing and have even eliminated the preparation of some records.
4. We have enough empty file cabinets to meet our needs for some time.
5. We took a few hours off from regular duties one day for housecleaning of desks and active files, sending almost 200 bushels of waste to the incinerator and the dump.

* Controller, Union Mutual Life Insurance Co. Portland, Maine.

Serving Job Order Cost Needs In a Steel Processing Plant

by T. W. BONNEVIER

THE CONCEPT OF PROCESS COST ACCOUNTING relates to continuous manufacture of well-standardized goods through large-volume operating centers. In a process cost system, an operation performed upon many units is identified as a cost center, and is costed as such with little reference to individual product units manufactured. At the end of a time period, units are divided into total costs and the resulting unit cost is transferred to the cost of the next process. The basic concern of job order costs, on the other hand, is the segregation of costs by product units, first, and by operating centers only for analytical or supplementary control purposes. Whatever the type of system, it always has the hazards for the accountant that record keeping may be performed to ascertain costs regarded as ends in themselves. Such systems, once established, tend simply to provide self-perpetuating careers for their custodians. Particularly, in any period of economic stress, the normal propensity to "control" costs results in the formation of secondary record systems with heavy emphasis upon the establishment of standards and budgets. Yet, although some of these systems are effective in increasing profits in the existing plant, many companies may operate less profitably, even so, than their industrial averages although their internal accounting systems may be highly refined in terms of budgets or standards.

It follows that standards may be of questionable intrinsic merit. Here is no quarrel with the idea of secondary accounts to detect bad plant operations, for some means must be provided, whatever the system. The argument is that costs must first be directed at purposes more dynamic and varied than cost control. They must first help management to obtain broader economic gains. Products and processes—and our familiar product stand-bys are most susceptible in today's economy—become obsolete. With products in particular, we must know when to reject the old or embrace the new. Decisions must be prompt. Tight cost controls will not help if the product or the process is outmoded. The

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THEODORE W. BONNEVIER (Chicago Chapter, 1941) is Controller and Assistant Vice President of the Acme Steel Company, Chicago, Illinois. He has been associated with this company for more than twenty-five years, serving as his company's Chief Tax Accountant, Bookkeeping Supervisor, and in other managerial capacities. Mr. Bonnevier is a member of the National Board of N.A.A. and is a Past President of Chicago Chapter.

difficult truth is that new investment funds must be generated from existing operations despite the fact that these, by virtue of their age, tend to grow less profitable. New products and processes must be fitted in without serious or frequent mistakes and must, in turn, support their successors as economic shifting continues. For these reasons, management of the Acme Steel Company has effectively reoriented the accounting activity, along with its operations, in a very few recent years.

In the face of common agreement that steel production characteristically adapts itself to process costing, we, nevertheless, follow a job order cost approach without a job shop organization. In this approach, we find costs flexibly without the costliness of undue detail. The reasons for process cost inadequacies are not hard to detect. Process mill equipment has undergone tremendous change since World War II, so that, today, one will not only produce greater volume than ever but also a variety of products so wide that it would be foolish to apply past standards. Products move from unit to unit in new channels, in some cases through new processes, as compared with past technology. Customer demands for products which we were unable to make a few years ago are a weekly event. Under these conditions, a monthly closing of process costs to units undistinguished within the accounting system would result in great waste, because it would hide information needed for management guidance. This absence of cost knowledge might well result in refusing orders for new products, with progressively weaker competitive ability.

Giving Recognition to Existing Conditions

Under these and related post-war pressures, our management pragmatically accepted the necessity for turning its managerial time chiefly to planning. The accounting system would have to enable the operators to control their operations so that day-to-day problems would absorb less of top management's time, enabling it to be devoted to construction of new facilities and renovation or dismantling of old ones. The following were found to be the considerations within which our system must operate:

1. Lack of engineering and accounting personnel to develop budgets in the planning period anticipated, meant that the accounting function would have to get good profit reporting out of our primary system of accounts.
2. If operators were to succeed in controlling costs, cost-profit reporting would have to be almost graphically simple.

3. Basic mill operations, although too flexible in output for valid process costs, nevertheless could not be operated on a job basis or productivity might be impaired by excessive paperwork. Process costs would have to be maintained at the mill level and job production recording would have to be minimized to the essentials of unit time and crew time on each order. Charges for material are recorded by production control staff—not by operating foremen.
4. Job costs would still be essential for each order, as has been explained.
5. If job costs in the hands of the operators were as effective as hoped for, they would stabilize costs for particular types of orders. It was considered that, if such stability were achieved, budgetary expense factors would be developed automatically to be applied later on, as time permitted.
6. Management and operations staffs would need to get the same cost data to understand each other and to "cross-train" themselves concerning mutual problems of cost reduction from the initial installation phase to the budgeting stage.

The eventual compromise was to set up direct material and labor costs to job orders and indirect costs to process cost centers. The latter are resulting today in highly consistent month-to-month unit overheads by cost center, which can be applied to job orders with assurance of accuracy. As of today, we clearly have a system which gives management a dependable means for adding or discontinuing products. This has been our major goal. Secondly, we have cost controls by operating center. Our job cost sheets have served to support price adjustments on many of our steel specialties. Within the plant, our operators, who receive job cost reports, know when they will be called in to explain out-of-line costs. The consistency of most overhead rates obtained in our processing cost centers appears to have minimized resistance to proposed budget rates which, more recently, have been established in several cost centers. The production organization itself has also initiated a number of proposals for cost cutting innovations since plant distribution of cost sheets was started.

The Process Cost Element in the System

The underlying process system accumulates all indirect expenses through a structure of cost centers. Each cost center is also a responsibility center in operations. The schematic diagram shown in Exhibit 1 represents, generally, the flow of materials through these operations.

Cost centers are coded with a four-digit number. The accounts charged to

EXHIBIT 1

these cost centers are a three-digit system which provides sufficient classification for later analysis of departmental overheads. Another feature of the departmental costing system is statistical in nature. Data is accumulated as follows for later proration of departmental overhead to job orders:

3-digit Code	Operating factor	3-digit Code	Operating factor
060	Mach. min. of prod.	064	Standard cost
061	Mach. hrs. of prod.	065	Cwt. of product bonderized
062	Cwt. of product	067	Interdept. dir. lab. hrs.
063	Net sales dollars	068	Betterment dir. lab. hrs.

Characteristic costs charged to cost centers are indirect wages and material, repairs and maintenance charged at a predetermined rate, as well as pro-rated factory general expenses on productive labor. Shop and service overhead rates are included each month in the predetermined repairs and maintenance rates. Actual and charged rates fluctuate in a narrow range so that proration of charging rate variances does not involve large amounts.

Indirect materials are charged in on stores tickets. The labor charges are derived from foremen's weekly reports.

The Job Order Segment of the Cost System

The basis of the job order cost is the job order or, as we call it, the Factory Order (Exhibit 2). In the upper right corner of the order appears number 636-6005-011. This number, in the first seven digits, describes the product produced and, in the last three, the number of times it has been produced. Hence, there are provisions for numbers for up to 999 orders for the same item, to be in process at one time, many times more than will ever be needed. The factory order also carries the customer name and address (deleted from Exhibit

FACTORY ORDER

CUSTOMER
ADDRESS
CITY

S. O. NO. 80020 FLEX 636-6005-011
WANTED JULY DATE 5/17-5/23
PROMISED WK 7/23 COMPLETED

O	40 000#	9-5/16" X. 102 NO. 10909 H. R. HOT CLS ONLY PKLD & OILED SLIT APPROX. 36" O. D. 2 000# CLS.

EXHIBIT 2

ACME STEEL COMPANY — PRODUCTION ORDER COST ANALYSIS

DATE Mo.	D	Yr.	DEPARTMENT Number	Mach.	MAT. SUM.	QUANTITY	AMOUNT	UNIT COST	Departmental Expense	Order Number Class	Proc'e	No.	F I N
8	2	6			4	40030	204153	05100		636	6005	011	2
					5	42050	189225	04727					
			1222	6			468	00011	2340				
			1234	50			1103	00027	2978				

Material Summary Code	Total Cost	Adjustment
4. Finished Goods		
5. Prime Material	202773	1380CR
6. Supply Material		
7. Outside Charges		05066
8. Rejected Material		

Finish Code
1. Semi-Process
2. Finished.

EXHIBIT 3

2). Orders are prepared by the production planning department and also show the shipping order number and the date promised.

The item "0" (to be finished) is 40,000 pounds of $9\frac{5}{16}$ x .102 type 10909 hot rolled coils, pickled, oiled and slit into approximately twenty 36-inch outside diameter coils of 2,000 pounds each.

Further down on the order (not shown), the production planning department will indicate that, to produce this finished product the factory should schedule 42,000 pounds of $18\frac{25}{32}$ x .102 type 10909 hot rolled steel which will be in stock from the No. 2 Hot Mill during the week of June 25th. Raw material for orders is always designated as item 1, etc. (in the same column as 0). Items 2, 3, 4, etc., are the various processes through which the material must go to produce the specific product ordered by the customer.

Exhibit 3 shows the job order cost accumulation for this order. Under the date column, we find that the order was completed and cost figured in the month of August, the second batch, year 1957. The "material summary" column has digits 4 and 5 indicating that the figures to the right of it are for finished goods and prime or raw material respectively. Supply material chargeable to the order—outside charges and rejected material would call for Codes 6,

7, and 8 respectively. On the line with Code 4 in Exhibit 3, is indicated 40,030 pounds of the finished item produced at an inventory value of $2,041.53 or a per pound value of $.051. This unit price was predetermined at the time the order was accepted from the customer. It also will be used to establish the cost of goods sold and relieve inventory, as will be described later. On the same line Code 5 is indicated a requirement of 42,050 pounds of the prime material for the order, with an inventory value of $1,892.25 or $.04727 per pound. In the detail supporting this order will be a material requisition prepared in the factory from which the entry for Code 5 is made, as well as a finished goods slip from which the entry for Code 4 is made.

The performing departments, machine numbers and the actual direct labor, together with the per pound unit cost are next entered (partly shown on Exhibit 3). Departmental expense is computed by multiplying the actual labor by a predetermined overhead rate. In the far right column, beyond the number identifying the cost analysis with the factory order shown in Exhibit 2, Digit 2 indicates that the order is for finished material for sale rather than for semi-processed material to be finished on another order. The lower portion of Exhibit 3 shows the total cost of the order to be $2,027.73, which is determined by adding together the prime material value, the direct labor and departmental expense. This total is compared with the value ascribed to the finished goods and a variance of $13.80 is determined. The per pound actual cost is also shown as $.05066.

As orders are completed and figured, the cost department can compare the original estimate with the actual cost and call any variations from the estimate to the attention of the responsible persons. In most such instances, executive time is not involved. It should be noted, at this point, that entries and computations on factory orders are handled by machine, thus reducing clerical costs of the system. The essential simplicity of our departmental overhead framework makes this possible on conventional equipment. The results of each order are noted on a seven-digit comparative cost card. The results of this particular order will be entered on the comparative cost card carrying number 636-6005. These card records have several important uses:

1. To use in estimating the cost of similar items in compiling data for selling prices.
2. To make comparisons of various processing costs to determine the cheapest method of manufacture.
3. To set values for inventory of finished goods and work-in-process at end of accounting periods.

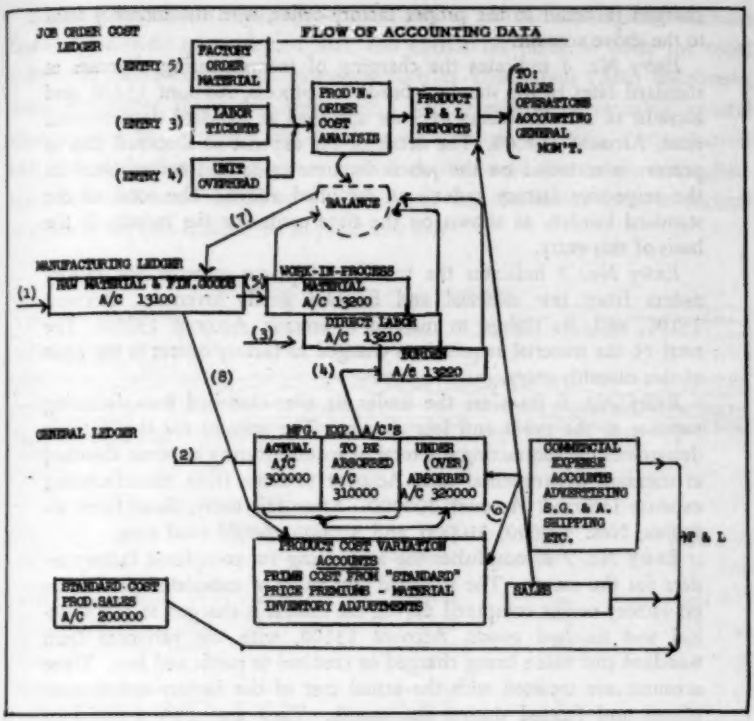

EXHIBIT 4

Flow of Transactions in Our Ledgers

In Exhibit 4 there is outlined the flow of cost accounting transactions. The entries are numbered in parentheses, indicating the sequence from the purchase of direct or raw material through the accounting for commercial expenses entering into the final profit and loss statement.

Entry No. 1 shows direct materials being charged to Account 13100, raw material and finished goods. Variances in cost of only prime raw material are computed and charged or credited direct to profit and loss, as will be discussed later.

Entry No. 2 indicates the charging of fixed and variable expenses to Account 300,000, manufacturing expense incurred.

Entry No. 3 indicates the charging of direct labor to Account 13210, direct labor in process. As direct labor is incurred, it is

charged in detail to the proper factory order, with the monthly total to the above account.

Entry No. 4 indicates the charging of manufacturing expenses at standard rates to the standard burden-in-process, Account 13220, and a credit to manufacturing expense absorbed at standard departmental rates, Account 310000. The detail of the expense so absorbed into in process is recorded on the job order time cards and accumulated on the respective factory orders, as described above. The total of the standard burden, as shown on the time cards for the month, is the basis of this entry.

Entry No. 5 indicates the transfer of prime material for factory orders from raw material and finished goods inventory, Account 13100, and, its charge to material-in-process, Account 13200. The total of the material requisitions charged to factory orders is the basis of this monthly entry.

Entry No. 6 transfers the under or over-absorbed manufacturing expense to the profit and loss account. The amount for this entry is determined by subtracting the total of manufacturing expense absorbed at standard departmental rates Account 310000, from manufacturing expense incurred, Account 300000. After this entry, these three accounts, Nos. 300000, 310000, and 320000, should total zero.

Entry No. 7 accomplishes the accounting for completed factory orders for the month. The standard cost value of completed production on factory orders computed during the month is charged to raw material and finished goods, Account 13100, with the variances from standard cost value being charged or credited to profit and loss. Three accounts are credited with the actual cost of the factory orders completed and figured during the month. They are: (1) material-in-process, Account 13200, which is credited with the cost of material recorded on completed orders, (2) direct-labor-in-process, Account 13210, which is credited with the cost of direct labor recorded on completed orders and (3) standard-burden-in-process, Account 13220, which is credited with the cost of standard burden applied to completed orders for the month. At any time the three in-process control accounts can be proved correct by mechanically adding the material-in-process, direct-labor-in-process, and standard-burden-in-process, as shown on the detailed cards in the file for the factory orders still uncompleted.

Entry No. 8 the total of the standard cost of goods sold is charged to profit and loss and credited to raw material and finished goods inventory account. As goods are shipped, the standard cost value is noted on the accounting copy of the shipping order by the perpetual inventory department. The total of shipments at the standard cost value is the basis of this entry. It should be noted that the value credited to factory orders individually is the value assigned to the shipment of the lot.

Shipping expense is separately accumulated in commercial expense accounts and is transferred to profit and loss, and entries are made to cover the usual transfer of other commercial expenses, such as distribution (field warehouse, order department, traffic department, etc.), selling expense, advertising, general administrative and research and development to profit and loss. Other income and other deductions, which cover cash discounts on accounts receivable collections, cash discounts earned on purchases and any extraneous items of income or expense, are also transferred to profit and loss.

PRODUCT PROFIT AND LOSS REPORT

PRODUCT DESCRIPTION	MONTH	YEAR	PRODUCT NUMBER
HOT ROLLED LOW CARBON SLIT EDGE COILS	SEPTEMBER	1956	63

Description	AMOUNT #		(*) % to Net Sales or Per Unit#	
	Current Month	Year to Date	Current Month	Year to Date
QUANTITY SOLD LBS	100 192 95	925 164 85		
GROSS SALES	525 426 75	4 725 592 00		
LESS				
RETURNS	1 580 29	4 223 64		
ALLOWANCES	592 35	1 323 33		
PRICE CORRECTIONS	225 00	405 17		
NET SALES	523 029 11	4 719 639 86	100 00	100 00
STANDARD COST	366 120 31	3 303 747 35	70 00	69 69
GROSS MARGIN	156 908 80	1 415 892 51	30 00	30 01
VARIANCES FROM STANDARD	926 06	8 505 26	17	18
OVERHEAD VARIANCE	462 13	4 056 14	09	09
PREMIUM STEEL	1 207 62	3 075 16	23	07
INVENTORY PRICE CHANGES		65 07	-	-
INVENTORY (QUANT.) CORR.	369 81Cr	2 145 07	07Cr	05
FREIGHT	2 628 65	28 662 95	50	61
INCOME BEFORE Adm. & Sell'g	152 054 15	1 369 402 86	29 08	29 01
ADMINISTRATIVE ALLGT'N.	18 729 56	166 706 95	3 58	3 53
INCOME BEFORE SELL'G.EXP.	133 324 59	1 202 695 91	25 50	25 48
SELLING EXPENSE				
SHIPPING	5 753 13	48 316 16	1 10	1 02
DIRECT SELL'G. EXP.	4 040 84	38 969 04	77	83
COMMISSIONS	807 12	9 588 01	15	20
OTHER DIST. EXPENSE	1025 51	11 386 51	20	24
INCOME BEFORE DEV. EXP.	121 697 99	1 094 436 19	23 28	23 19
INCOME BEFORE TAXES	121 697 99	1 094 436 19	23 28	23 19

#Complete form has "Last-year-to-date" columns.
*When per unit is computed on individual product statements lbs. are shown per cwt - pcs are shown per thousand; feet are shown per thousand - is is shown per each.

EXHIBIT 5

Product Profit and Loss Report

Exhibit 5 is an example of our product profit and loss report. This report to management under our job order cost system is appraised very highly by those who receive it. As has been stated, the products of our company are identified by a three-digit product number. Thus, there is a possibility of 999 different product groups. We currently report on about 500 different groups.

Each sales manager receives a monthly report on each product group in his line, identified by the product group code and also a two-digit summary of all products related through the first two digits of the code.

Top management receives a copy of a summary statement for all products carrying the same first digit. It will be noted that Exhibit 5 carries a two digit product identification. This summary we will present to the hot rolled steel sales manager, together with similar reports showing the three-digit detail, the totals of which have been accumulated into this summary.

All product profit and loss reports carry the same information as shown in Exhibit 5. The data for quantity sold, gross sales, and standard cost are obtained from a copy of the invoice after shipment. The standard cost is at the same value as credited to the factory order, as described earlier. The returns, allowances, and price corrections are obtained from credit memos processed by our credit department after approval by proper authority. We feel it is essential that this information be shown, as it is an indication of customer satisfaction with the product being reported. Standard cost deducted from the net sales results in the gross margin. This figure, by product, is of special significance to our sales management as it represents to them the one figure over which they have the most control. Also, they know that each product group, through sufficient volume of proper margin, is their contribution to allocated expenses and profit.

Variance from standard is shown as a deduction from gross margin. This is the total variance of actual from standard cost on factory orders in the product group carrying the same product code number. Next shown is overhead variance. This difference between actual and standard overhead applied to orders is computed for each productive department and apportioned to products flowing through the department. The basis for this allocation is the overhead charges to the products for the month as identified by the group number. The item shown as "premium steel" is a purchase price variance on raw material and is allocated to products (three-digit detail) on the basis of tons put in process for the product that month.

Exhibit 5 shows "inventory price changes" next. Whenever it is necessary to change the standard, i.e., inventory value of a product or group of products, the perpetual inventory department is notified. The quantity of the specific item on hand is changed to the new price and the adjustment made to the product (three-digit detail) involved. Subsequent charges to cost of sales will then be at the new price. Likewise, subsequent credits to factory orders will be at the new price. Inventory quantity corrections appear next. These concern the perpetual inventory periodic checks of quantities on hand. Any overage or short-

age of physical counts is credited or debited to an account for this identified by the three-digit detail to the product involved. Freight, next listed, is the actual freight paid to carriers identified by the same product detail.

The next line, income before administrative and selling allocation, is also quite important to the recipients of the report, as it shows the gross margin adjusted for the items directly chargeable to the product line and is the profit contribution of the product group before arbitrary allocations. It is followed by administrative allocation which goes as far as product line (two-digit summaries only) on the basis of conversion cost, i.e., direct labor and overhead, involved in producing the product. Thus if any two-digit product group has two per cent of total conversion cost, it will receive two per cent of general administrative expense of the company.

Shipping expense, as shown on Exhibit 5, is charged to product line (two-digit detail) on the basis of expense accumulation of material and labor used. In our business, most shipments are made on wooden skids. Each shipping order carries a notation of the type and number of skids. These are tabulated monthly by sales product group (two-digit detail) and comprise the bulk of the material charges to shipping expense. Labor of shipping is charged by the various shipping employees to the product groups shipped during each day on their time cards which are tabulated monthly and are the basis of assessing the the overhead of the shipping department.

Direct selling expense is charged to products on the basis of periodic surveys of salesmen's time on the various products sold or on a tonnage basis for other types of products. Commissions are those actually paid to a few remaining commission men for orders obtained when the material is shipped. Any such payments are identified by the product involved. Other distribution expense is the expense of the order department, traffic department, credit department, and field warehouses if involved in distributing the products.

We now arrive, in our review of Exhibt 5, at net income before development and experimental expense. This category is charged to products by the engineering department and shop on the basis of work orders, properly approved before the experiment is started. Each product manager is given a copy of the work order and periodic reports of expenses as they accumulate. He watches these against the original appropriation and progress on the project as reported by the developmental engineer.

The extreme right section of Exhibit 5 provides for information on per cent to net sales for the periods indicated or, for the three-digit statements for the various product managers, per unit comparisons instead. In these cases, the average selling price is shown, with the average standard cost and other items

likewise shown as per unit. Examples are per cwt, per thousand or, in some cases, per individual unit.

Other Reports

A number of other reports are distributed, including departmental expense statements to all responsibility centers. These show only controllable expenses. Copies go to foremen for their departments, to office department heads, to sales area managers, and to warehouse supervision. On these statements, certain volume data is supplied to permit a measure of volume against expense, the first step to an ultimate budget control of expenses for all levels of supervision. Reports are likewise made to research and development supervision on projects and showing projects approved and cost to date. Top management sales managers and others also receive a copy of this report. Daily performance reports go to manufacturing supervision and industrial engineering (time study and rate setting department). A daily reject report, showing point of rejection, reasons and comments for manufacturing supervision is an important part of our scrap control system.

System Corresponds to a Trend in Process Industries

The mechanics of any cost system are no better than the extent to which they serve the needs of the enterprise. Where a highly variable product mix has grown out of a process-type operation, neither a job order or process cost system will be adequate of itself. Thus, the two concepts have been integrated more extensively in our case than is usual and may have broader implications. We feel that in all process-type industries, greater flexibility of product as techniques of operation become more varied, will force more accounting systems into a combination system such as the one outlined. Because it is serving to guide management in keeping the company's product mix abreast of demand at an increasing profit, we feel that it would bear consideration of others with similar costing problems. Also, the technique of establishing standards based on actual performances, by means of such a system, has greatly simplified our cost control approach as competition increases.

When Does a Suggestion Award System Yield Profits—And How Much?

by DONALD G. LOHRMAN

HUMAN RELATIONS BENEFITS are prime factors to be considered in the establishment of a suggestion award system and are possibly, in themselves, sufficient reason to continue such a program once it is begun. These factors, involving employee morale, are best evaluated by the personnel experts, but, along with such intangibles, the financial benefit to the company is also of pertinence to management. We might then, as accountants, ask this question: In accepting the human relations aspects as beneficial to the general company welfare, have we built another fringe benefit into our cost structure, or have we installed a system which will provide a reasonable return on our expenditures?

Our company has conducted a suggestion award program for a number of years, and, although it was felt to be a profitable one, no financial evaluation had been made of the system in general. Information concerning any return to the company was limited to estimates of first-year savings for each accepted suggestion. Whether the system was a loss proposition, whether it merely paid for itself, or whether it provided a profit to the company was not known. We decided to find the answers to these questions. Human relations features of the program were not to be within the scope of our study. The investigations which resulted have shown conclusively that the system has not only paid for itself and provided its own working capital within a period of three years but also produced a substantial profit return per dollar of cost.

Assumptions Made

The discussions and illustrations to follow have been compiled from a case study of the suggestion program in one plant of our company. The study consisted of a comprehensive and detailed review of each suggestion processed by the plant during the four-year period from 1953 through 1956 inclusive. The purpose was to obtain, without spending a prohibitive amount of time, reasonable evaluations of all savings and expenses resulting from the processing and

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DONALD G. LOHRMAN (Lancaster Chapter, 1948) is Senior Auditor with the Armstrong Cork Company, Lancaster, Pennsylvania. Mr. Lohrman is a graduate of Pennsylvania State University.

installation of employees' suggestions. We first directed our attention to an analysis of the system itself, the procedures involved, and the nature of suggestions submitted. Having thus determined all savings and cost areas in the program, we grouped them into the following categories:

Savings	*Costs*
1. Tangible	1. Award
2. Intangible or indirect	2. Investigative
	3. Experimental
	4. Installation and equipment
	5. Administrative

In the initial steps toward organizing the study, it became apparent that, in order to provide a consistent and adequate basis of measurement for these groups of savings and costs, certain basic assumptions had to be made. These were:

1. That the award system began in 1953 (the first year to be covered by our study) with no savings accruing from suggestions processed prior to that year.
2. That savings credited to a suggestion would not have occurred if the suggestion had not been made and accepted.
3. That, in those areas in which factual savings or cost data were not available, current estimates by foremen and supervisors would be acceptable.
4. That all costs pertaining to a suggestion were incurred in the same year in which it became effective or was rejected.
5. That the time of all participating hourly and salary personnel represents cost to be allocated to the program. In other words, we have assumed that the time required contributes directly toward the total personnel requirements of the plant.

Studying the Savings and Relating the Costs

After accepting these basic assumptions, our detailed reviews of each suggestion in the period from 1953 to 1956 began. Our methods of analysis and the summary treatment for each category of savings and cost are described in succeeding paragraphs.

Tangible savings data were obtained in most cases from the original estimates of foremen and supervisors submitted at the time the suggestion was investigated for possible acceptance. These estimates were substantiated (or revised) during our study, through interviews with qualified persons. Some savings data were also available from the files of the industrial engineers in cases in which follow-up studies were made by them. Through these interviews, we also deter-

mined the effective dates of accepted ideas within the four-year period of the study, in order to obtain the proper accumulation of annual savings. The savings dollars derived represent reductions in expenditures for material, labor, mechanical overhead charges (if applicable to labor) and a percentage of labor dollars covering employee "fringe benefits."

Intangible and indirect savings posed a problem. We quickly recognized in our study that savings from certain classes of accepted suggestions are extremely difficult, if not impossible, to evaluate. These are suggestions which pertain to general plant welfare and safety, which we have considered to represent intangible and indirect savings. In this category, we also included ideas not expected to produce savings beyond $50 per year. Awards were made to this class of suggestion because, in the judgment of those concerned, the suggestions will pay for themselves. Because of the nature of these intangible and indirect savings awards, we eliminated them from figures developed to compare savings and cost and showed instead, as a note to data for each year, the total of installation and award payment costs for these items. This is the amount which the awards, as a group, must recover in savings over some undetermined and, of course, indefinite period of time. We did, however, regard the investigative and administrative costs applicable to intangible and indirect savings awards as part of the general operating costs of the program and, therefore, included them with the costs for intangible savings awards in the summary.

Award costs include initial award payments to employees, as well as any supplemental payments, for all suggestions which were both accepted and which became effective within the four-year period of 1953 to 1956. The supplemental payments referred to are made when savings from an accepted suggestion have been firmly established during one year of effective application of the idea. These and initial award costs were obviously based on factual records and were readily available.

Investigative costs were calculated on the basis of estimates, by foremen and supervisors, of the time spent investigating the practicability of the suggestion, supervising any tests or experiments, evaluating an accepted suggestion, and completing the necessary paper work. From these estimates an average investigative time of 1.2 hours per suggestion was developed. An average salary rate per hour for each of the four years included in the study was applied to the total time requirement for the investigation of all suggestions (accepted and rejected) submitted in each year. The average salary rate was based upon base salary plus a percentage covering "fringe benefits," and was also weighted to compensate for the variations in time spent by the foremen and supervisors involved.

Installation and equipment costs included material, labor, mechanical over-

head and, for those installations which were capitalized, engineering overhead. Capital outlay, as well as current expenditures, were recorded in total for the year the installation became effective, since these outlays were required to effect the savings of the accepted suggestions. Also included in this category of cost, to keep things simple, were experimental and test costs (other than supervision) of both accepted and rejected suggestions. The costs for installing the accepted suggestions were determined in most cases through interviews with foremen and mechanical department supervisors. These costs were substantiated, whenever possible, by reference to the job orders covering the installation.

Administrative costs include such administrative expenses as: (1) the time (other than investigative) of plant staff members spent in suggestion committee meetings and in processing and approving suggestions, (2) the clerical time required to expedite, record, type, and file suggestion details, (3) costs of promotional material, (4) costs of stationery, and (5) a share of general company administrative costs, such as personnel administration, payroll department, and

SUGGESTION AWARDS SAVINGS VS. COST SUMMARY —(1953 THROUGH 1956)
(Excludes Accepted Intangible and Indirect Savings Awards) PLANT A.

Savings	1953	1954	1955	1956	Total
1953 Awards	$3,221	$4,760	$4,750	$4,660	$17,391
1954 "		1,730	2,842	2,800	7,372
1955 "			3,325	4,326	7,651
1956 "				1,086	1,086
Gross Yearly Savings.....	$3,221	$6,490	$10,917	$12,872	$33,500
Less: Total Costs*	5,318	5,417	4,738	5,143	20,616
Net Profit or (Loss)	$(2,097)	$1,073	$6,179	$7,729	$12,884
Cumulative Profit or (Loss)	$(2,097)	$(1,024)	$5,155	$12,884	
Cumulative Profit or (Loss) Expressed as % of Cost $	(39)%	(10)%	33%	63%	
Suggestions Processed	118	100	177	108	503
Cumulative Profit or (Loss) per Suggestion Processed	$(17.77)	$(4.70)	$13.05	$25.61	
Suggestions Accepted	76	58	62	64	260
Cumulative Profit or (Loss) per Suggestion Accepted	$(27.59)	$(7.64)	$26.30	$49.55	
Number of Awards from Prior Years still in Effect beyond 1956	18	16	8	11	
Annual Rate of Possible Future Savings on these Awards	$4,460	$2,800	$4,538	$1,610	

* Total investigative and administrative costs in each year for all suggestions processed are included. Installation and award payment costs for accepted indirect and intangible savings suggestions have been excluded.

These excluded costs, which it is assumed will be recovered by equal amounts of savings during the effective life of the awards, are:

1953	$2,435	on 47 suggestions
1954	2,731	" 40 "
1955	2,580	" 41 "
1956	* 1,723	" 44 "
Total	$9,469	on 172 Suggestions

EXHIBIT 1

legal department services. Estimates of the time spent by persons involved in these functions were converted to dollars on the basis of base salary rates plus the applicable percentage for employee fringe benefits.

What the Summary of Data Showed

Summarization of these groupings of savings and costs took shape as in Savings versus Costs (Exhibit 1). This provided the indication that a three-year period is required before the accumulation of continuing savings would result in accumulation of profits. Further gains accrue during the fourth year, providing an accumulative profit return of 63 per cent on total costs of the program for the period. We believe this to be the year, therefore, which begins to show the return from a continuing business standpoint. It can be seen from analysis of Exhibit 1 and also of the Cost Summary, (Exhibit 2), that the twenty-nine tangible savings suggestions of 1953 had, by the end of 1956, produced accumulated savings of $17,391, a profit of $12,073, and a net return of 227 per cent based on costs of $5,318. Eighteen of the suggestions were still in effect after three years, producing savings at an annual rate of $4,460.

Extension of the Evaluation to Future Years

In performing this financial evaluation of our suggestion award system, we realized the need for recording suggestion cost and savings data in a manner which will make it readily available for any future or continuing evaluations of the program. Accordingly, we found that simple but effective additions to the forms already in use could provide the necessary information for both accepted and rejected suggestions, from which reasonable conclusions concerning financial return could be obtained.

The investigator's initial report, which is submitted to the award committee with his recommendations for acceptance or rejection of the suggestion, was expanded to include notations of: (1) estimated investigative and experimental time, (2) other expense incurred in investigations, experiments or tests, together with cross references to work orders, if any, and (3) gross savings estimates on an annual basis, together with the investigator's cost and savings analysis calculations.

Following the installation and effective application of an accepted suggestion, a final report is prepared by the investigator stating the effectiveness of the installation and, in most cases, providing authority for payment of the award to the employee. At this time the investigator also inserts on the form: (1) the

SUGGESTION AWARDS COST SUMMARY — PLANT A (1953 THROUGH 1956)

	Processed	Accepted	Rejected	Awards Paid	Investigation Costs	Installation	Admin.	Total Costs	Cost per Suggestion Processed	Cost per Suggestion Accepted
A. All Suggestions										
1953	118	76	42	$ 761	$ 602	$ 5,227	$1,163	$ 7,753	$65.70	$102.01
1954	100	58	42	656	519	5,764	1,209	8,148	81.48	140.48
1955	177	62	115	956	1,019	4,091	1,252	7,318	41.34	118.03
1956	108	64	44	732	617	4,202	1,315	6,866	63.57	107.28
Total	503	260	243	$3,105	$2,757	$19,294	$4,939	$30,085	$59.81	$115.71
B. Intangible and Indirect Savings (1) Suggestions Only										
1953		47		$ 189	$ 236	$ 2,246	$ 463	$ 3,134		$ 66.68
1954		40		174	255	2,557	484	3,470		86.75
1955		41		194	226	2,386	290	3,096		75.51
1956		44		225	258	1,498	535	2,516		57.18
Total		172		$ 782	$ 975	$ 8,687	$1,772	$12,216		$ 71.02
C. Tangible Savings Suggestions and All Rejected Suggestions										
1953	71	29	42	$ 572	$ 366	$ 2,981	$ 700	$ 4,619	$65.06	$159.28
1954	60	18	42	482	264	3,207	725	4,678	77.97	259.89
1955	136	21	115	762	793	1,705	962	4,222	31.04	201.05
1956	64	20	44	507	359	2,704	780	4,350	67.97	217.50
Total	331	88	243	$2,323	$1,782	$10,597	$3,167	$17,869	$53.98	$203.06

(1) In the four-year period, approximately 66% of all suggestions accepted were for items of an intangible or indirect savings nature. They accounted for 45% of the installation costs and 24% of the award payments. Half of this group of awards were paid for safety suggestions which accounted for half of the installation and award costs of the group.

EXHIBIT 2

actual equipment and installation costs involved, (2) a cross reference to the job order and date under which the work was done, (3) the date the installed idea became effective and (4) first-year (annual basis) net savings after equipment and installation costs.

These basic reports, when summarized annually, provide the basis on which to calculate first-year savings for suggestions submitted during the year. Investigative time summarized from the reports can be evaluated at current average salary rates for the company unit involved. This leaves only administrative costs which have not been accumulated throughout the year from basic suggestion reports. These can be readily calculated on the bases established in prior years adjusted for any procedural or organization changes, changes in wage or price levels, and special promotional campaigns and materials.

It can be seen that data thus derived will provide us with cost and savings information for the current year's suggestion activity only. However, we have concluded that this will provide adequate information for effective administration of the suggestion award program. A detailed analysis, such as that illustrated by our study, was of prime importance in satisfying ourselves of the general profitability of the program but, due to the difficulties in determining the effective life of awards, we do not believe a continuing annual study is advisable, once the basic financial evaluation has been made. Clerical effort should be expended only to the extent that it will contribute data which is useful to management in the administration of the program.

We believe that data accumulated each year from the current year's activity can provide adequate information for the control of operating costs of the program, as well as information which will indicate areas of opportunity for increased savings from the program. For example, comparisons among various departments or plants (such as those indicated at plant level in Exhibit 2) can direct attention to areas where investigative or other costs appear to be high, and also to areas where more suggestions and more remunerative suggestions are being submitted. Investigations should then be made to determine the reasons for these variations.

Reliable (Not Precise) Figures

In the financial evaluation of our suggestion award program reported on in this article, we quickly recognized that it does not lend itself to exact calculations. However, we have found that reliable data can be accumulated which will establish the degree of economic benefit to the company. These reports are expected to provide information useful for developing a more efficient and profitable suggestion award program.

MINIMIZING INVENTORY VARIANCES—by Paul G. Lapira*

MOST COMPANIES END THE YEAR with that bane of all cost accountants—inventory variances. We at Oakville Company, a division of Scovill Manufacturing Company, are no exception. Despite a constant refinement of our cost accounting system and the accounting department's continued vigilance, variances continue to crop up each year. However, we have, in recent years, made considerable progress both in tracking down their causes and minimizing the overall effect. In this article, I shall discuss:

1. What we have discovered, through careful analysis, to be the general causes of our inventory variances.
2. Preventive measures we have taken to limit the extent of the variances.
3. Our year-end analysis of the difference between our book balance and the physical inventory.

We have twenty-five work-in-process and five stores-inventory accounts for which we maintain running book inventories of total dollar value per account. We arrive at our finished goods inventory value through analysis of the annual physical inventory. The work-in-process inventories consist of the value of the millions of formed wire and stamped metal parts which we manufacture. Our standard cost system is designed to keep price and quantity variances for labor, overhead and material out of these book balances. Material is credited out of stores at "fifo" actual and charged to work-in-process at standard, with the price variance going directly to cost of sales. Quantity variances are charged or credited to cost of sales through our scrap variance procedure. Labor and overhead are credited to manufacturing expense and charged to work in process at standard.

Causes of the Variances

One cause of inventory variances has been withdrawing from stores for one account and using in another without making the proper accounting transfer. All of our departments make or finish goods for more than one account and, in many instances, the same size and type material is used in making the products for three or four accounts. Often a foreman will "borrow" material from one order to complete another in a different account and neglect to notify the accounting department of the transfer.

Another significant variance cause cause lies in giving credit to one account for scrap produced in another. In our cost accounting setup, the standard value of material in finished goods is credited out of work-in-process when the goods are sold. The standard value of pounds of scrap is

* Factory Accountant, Oakville (Conn.) Division, Scovill Manufacturing Co.

credited out when the scrap is sold. As some of our departments fabricate goods for several accounts and use various types of material for each account, it would not be practical in these departments to have a scrap barrel for each type of scrap for each kind of material cut up for each account. This would take up too much floor space. Hence, in these departments, we combine similar types of scrap for all accounts in one barrel and the foremen estimate the amount in each barrel applicable to each account. These estimates cannot be completely accurate.

Material control department errors in posting to stores withdrawal sheets, cost accounting department errors in extending material withdrawals, caused by misinterpretation of type of material, posting errors or arithmetical errors are still other causes of inventory variances relating to materials. Posting and extending errors in the cost of sales also contribute.

The charge to work-in-process for labor and overhead is an accumulation of standard cost charges for the operations performed in the factory. These charges come to the cost accounting department through the timekeeping procedure. Earned hours or batches from any manufacturing, finishing or packing operation, extended by the standard labor and overhead cost per hour or per batch for the operation equals the inventory charge. The cost of sales is the total standard cost per unit for all the standard operations required to make, finish and pack an item. These operations are itemized and costed on standard manufacturing records maintained in our standard cost department. We have over 6,000 active records. Causes for labor and overhead caused inventory variances are as numerous as those for material. One is performing operations not on record and turning time in to be charged at standard. This includes unauthorized reworking and refinishing and unauthorized inspecting or secondary operations. As to the latter, our tabulating department will automatically calculate standard cost charges for all operations turned in. It would be impractical to check each charge to make sure it is legitimate. It would be impossible to check the reworking.

A second cause of inventory variance related to labor is not performing operations on record. In some instances, secondary operations are eliminated through methods improvements and the standard cost department is not notified to change the records. Since the records are the basis for the cost of sales, it will contain a charge for the operation omitted. With no charge going into work-in-process for the operation, the book inventory is excessively deleted every time a unit is sold. Timekeeping, posting and extending errors as well as using incorrect standards, also create variances. Producing new items for which there are no records and not keeping proper

production records from which to make inventory charges when standards are finally set does the same thing.

A cause of variance relating equally to material, labor and overhead is inventory shrinkage. This splits up into (1) pilferage and (2) throwing work in scrap barrels after it has some labor and overhead attached to it, and not notifying cost accounting so that it can credit the labor and overhead out of the book inventory. Selling goods in one account made in another and not notifying cost accounting to make the inventory transfer is a cause which may be mentioned at this point.

Preventive Measures

There are a number of ways to prevent occurrence of inventory variances. Auditing is one. The factory auditor checks material charges to each productive order in existence in a department. He also checks standard weights for each item produced. Spot checks of various records and monthly cost accounting calculations are made.

Monthly scrap reports help. The scrap report is a comparison of actual and standard scrap for the various products and lines. It is not possible to analyse all products because of the difficulty in arriving at an average standard scrap figure for some products where the amount of standard scrap varies considerably among items in a line or department.

In extending preventive measures to labor and overhead, audits also help. It is practicable, too, to issue orders against which to charge time extra operations or new items until standards are set. At that time the proper charges are cleared from the expense order to the inventory. Another measure is to educate foremen and timekeepers and impress on them the cost accounting problems and false profit picture which can result from their carelessness. We have several meetings with our foremen to acquaint them with our cost accounting system. The importance of accurate reporting is stressed to all timekeepers. It is worthwhile, likewise, to educate production chasers who have a tendency to short cut time-consuming (to them) paper-work. Nor does it do any harm to stress to the superintendent's office that the difference between "good" and "bad" variances is not in over and under absorption but, in explainable and unexplainable variances. Constant pressure to reduce legitimate under absorption only leads to "hiding costs."

Further measures to prevent inventory variances are a shrinkage allowance in the cost of sales and a variable monthly inventory budget against which to check ending monthly book balances.

Investigating Variances Between Book and Physical

As stated before, in spite of preventive measures, there are always variances between year-end book balances

and the physical inventory. The procedure described in this and the following paragraphs is used in trying to explain these differences. We eliminate all known causes of differences between book and physical, such as:

1. Pricing physical at new labor and overhead rates or new material standards.
2. Scrap write-downs in pricing the physical.
3. Rough weight write ups (or downs).

We take each account separately to determine if the variance is in material or labor and overhead. To do this we compare monthly material charges to work-in-process and cost of sales by type of material. Discrepancies here are relatively easy to spot. We do the same for labor and overhead, breaking the charges to work-in-process down by department. Here, as in the material analysis, we are comparing total dollar charges per account rather than the charges for any one item in an account. In making the above comparisons, any unusually high or low charges to work-in-process or cost of sales are discussed with people who know the lines well enough to verify them.

The labor and overhead charges by department are then examined and the relationship among making, finishing and packing department charges checked for anything that looks out of line.

Timekeeping reports from departments with large variances on labor and overhead budgets are examined. There is also a check on items with tricky costing operations. Some items have allowances for a portion of the production to be inspected or refinished or go through some other secondary operation. If a greater or less amount of these secondary operations is done on these items than is allowed for on record, the book inventory will be thrown out of balance.

If, after going through the above steps, any of the inventory differences still have not been reconciled, we try as a last resort to trace the charges on the large production items in the lines still out of balance. The beginning physical inventory plus quantities for which time has been charged into inventory, less quantities in cost of sales, should give us ending balances against which to check the book and physical. The step is difficult to perform because:

1. We make thousands of different items and it is a time-consuming task to go back and pull out the timekeeping charges for any individual item. The number of tabulating cards which have to be sorted is tremendous. In a year we accumulate so many cards that we have a storage problem.
2. To facilitate timekeeping, the charges from finishing operations are not identified by item.
3. Many items have several manufacturing, finishing and

packing operations. The charges from any one of these operations could be the cause of our problem.

Investigation is a step-by-step procedure. The factors causing the inventory variances may be discovered in any one of the steps. Some of the discrepancies are cleared up early in the procedure. For some we have to go through to the "bitter end," but we keep plugging away ("plugging" not to be taken in its literal accounting sense) until we have analysed all variances to our satisfaction. With a combination of our cost accounting analysis, weekly and monthly labor and overhead budgets, variable inventory budget, preventive measures and year end inventory variance analysis, we at Oakville feel we have made great strides in inventory variance control.

DON'T NEGLECT CORPORATE RECORDS by Clayton C. McMurray*

MANY HOURS OF WORK and reams of paper are applied every day to the creation and maintenance of business records. Usually these records take the form of cost accounting records, financial statement analyses, details of overhead accounts and preparation of forecasts and budgets. These seems to add up to an impressive amount. However, I submit that in addition, many companies should be devoting more time and effort to proper maintenance of their corporate histories. These are the records which are most often neglected, particularly by the medium-sized or small companies. It is true that financial statements are a necessity and, in a manufacturing or processing operation, cost accounting records and reports are equally important. N.A.A. doubtless has many members whose entire efforts are devoted to these objectives. But in addition, there are also many whose responsibilities encompass the creation and maintenance of basic corporate records. It is to this group that the present remarks are addressed particularly.

Included in the category of corporate records often neglected are: articles of incorporation, by-laws, corporate minutes, important contracts, tax returns, special reports to governing bodies, and an analysis of surplus from the inception of the company, both for accounting purposes and tax purposes. The answer to this problem is the establishment of a company "permanent file." This solution may appear to be an easy one and, if your company is relatively

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* Manager, Peat, Marwick, Mitchell & Company, Kansas City, Mo.

young, it may be. Suppose, however, that the company has been in business for more than ten years (not a very long time) and there has not been continuous maintenance of the records. This is not uncommon. Many businesses have been quite small in their beginnings. Perhaps one or two shareholders, devoting their entire time to building the business, have left the *relatively* unimportant details of records to their bookkeepers, who often did not have extensive accounting backgrounds. In the interim, there may well have been considerable turnover in this personnel. In such circumstances, the chances are excellent that the records I am concerned with have been neglected.

Some such records can be brought to a current status easily. Others will present considerable difficulty. In either instance, there should be some effort devoted to bringing all corporate records up to date. Articles of incorporation and all amendments can be obtained from the state of incorporation by writing to the secretary of state. Thus, this record can be made current easily. Company by-laws can present some problems. It is desirable to have these together with other reflections of company policies and rules, filed in some permanent form. Many companies keep them in the same file with their articles and corporate minutes. The file should be preferably in a hard backed cover and appropriately labeled and indexed. The same file should contain all amendments to the by-laws, and the original provisions should be marked to indicate that they have been superseded or amended.

Minutes of meetings of the shareholders and of the board of directors should be maintained in a permanent type of book. Only the originals should be so filed and they should bear the signatures of all persons required to authenticate them. In order to insure that none are lost, each page should be numbered and a periodic review made to ascertain that all pages are in the file. Every effort should be expended to have the minutes of each meeting prepared and signed as soon as possible.

What to include as corporate documents in a permanent document file will vary with each company. Certain to be included are bond indentures, stock indentures, pension trust agreements, profit-sharing plans, employees stock option agreements, long-term leases and many others.

There is little need to dwell on the necessity of maintaining a complete file of the company's income tax returns. This file should be kept complete by the inclusion of requests for extensions, waivers granted, revenue agents' reports and similar data.

One of the records which should always be maintained and continuity preserved, whenever there is a change in personnel, is an analysis of surplus. Often it is necessary to refer to this record to determine what occurred many years prior. Hours and days of delay can be averted if this analysis is current. If it does not exist, it can, of course, be created but only if all of the old records can be located. If they are not all available, then at least the problem has been uncovered. Because surplus is not necessarily the same for both accounting and tax purposes, two analyses may be necessary.

It is very important to realize that all of these records can and usually do include confidential information, and may not be reproducible if lost. The type of protection afforded them is, therefore, also important. Files, if used, should be fireproof to the greatest extent practicable and should be capable of being locked. Access should be restricted.

The extent to which corporate records are maintained will vary greatly with the individual company. What has been outlined here is, in the writer's opinion, a minimum. Only a comprehensive review of the records of your company will disclose exactly how extensive such files should be. But of this I am certain: your company will be much better off if it does not neglect these oft neglected records.

(*Continued from page* 56)

principles as they now exist or as a discussion of the desirability or undesirability of changing them. It is, instead, a suggestion that the successful accountant, to be of greatest value to his employer and to achieve the highest degree of professional competence, must have a clear and thorough understanding of all of the various viewpoints of those whom he serves and of all of the available techniques for rendering that service in the most effective way possible. By adopting this approach he will be truly a professional accountant, entitled to the respect and confidence which that term implies.

Beyond these Covers

Books

Accounting Reports for Management

Rosello B. Lewis, Prentice-Hall, Inc. Englewood Cliffs, N. J. 1957, 187 pp. $15.

This is an extended case study of the reporting techniques introduced by the author at Olin Mathieson Chemical Corporation where he is vice-president and comptroller. Many of the 29 exhibits, mostly full-size reports, are folded into the volume. Control of multi-plant operations is involved in the methods exemplified.

Overhead Costing

R. Lee Brummet, School of Business Administration, University of Michigan, Ann Arbor, Michigan, 1957, 157 pp, $5.00.

An old, old topic (accountingwise) is given a new treatment here with central attention to the effect of overhead upon income measurement. Distinction between the interests of accounting for financial statement purposes and for managerial purposes is made with respect to overhead and it is even suggested that the matching of commercial and administrative expenses with revenue for the former category of purposes be studied. An initial chapter reviews history of overhead accounting.

Office Automation Applications

R. Hunt Brown, Automation Consultants, Inc., 155 Fifth Ave., New York 10, New York, 1957. Loose-leaf, $37.50.

Many types of applications of many varieties of automatic equipment are illustrated in this volume, which includes case studies grouped by industry classifications. Illustrations include diagrams, summaries, forms, and half-tones of equipment and its use.

19th Annual Institute on Accounting

Bureau of Business Research, Ohio State University, Columbus, Ohio, 1957, Paper Bound, 149 pp.

A report of last May's proceedings of one of the more well-established accounting institutes, this gathering together of addresses is many-sided, with several papers each in the areas of accounting education and data processing, together with similar attention to Federal taxation. The closing address is entitled, "Organization and Operation of a Government Corporation".

Institute of Accounting

University of Colorado, Boulder, Colorado, 1957, Paper Bound, 59 pp.

Noted also as report of the proceedings of the fourth annual accounting institute at Boulder, held last April, this collection of addresses embraces the following titles: "The Symptoms of the Need for Installation of Mechanical Accounting Equipment", "Changing Auditing and Accounting Procedures Resulting from Automation", "A Case Study in Methods and Procedures, and "Results of Inadequate Financing."

Earning Our Opportunities

Institute of Internal Auditors, 120 Wall St., New York 5, N. Y., 1957, Paper Bound, 80 pp.

The 16th Annual Conference of the Institute of Internal Auditors was held in May 1957. The addresses there presented, together with the 1957 Thurston Award paper, are published under the present title, which is also the title of the opening talk. Others are "Staff Training", "Electronics", and "Auditing Factory Operations". The awards paper deals with "The Audit Report".

Conference Proceedings 1957

National Machine Accountants Association, 53 West Jackson Boulevard, Chicago 4, Illinois, 1957, 248 pp. $3.

Published as the October 1957 issue of the *Journal of Machine Accounting*, these proceedings range widely over their field and include general addresses, case studies, and panels, all well fortified with programs, tables, diagrams, and illustrations of equipment and its use.

Cases in Retail Management

McNair, Burnham, and Hersum, McGraw-Hill Book Co., 330 West 42nd St., New York 36, New York, 1957, 806 pp., $10.

The cases offered in this book—68 in number—are arranged topically. Examples of these topics are "elements of retail profit and loss," "personnel", and "control". In the last-named group are individual cases relating to "lifo", stock control, expense budgeting, and financial management.

Business Tools for Service Station Dealers

American Petroleum Institute, 50 West 50th Street, New York 20, New York, 1956, 43 pages, Paper Bound, $1.50.

The subtitle of this manual-type publication is "ideas for record keeping." It consists of text and illustrative fold-in forms in line with its title. It is attractively prepared and prefaced by convincing testimony as to usefulness.

Long-Term Leases

Albert H. Cohen, School of Business Administration, University of Michigan, Ann Arbor, Michigan, 1957, 150 pp, Paper Bound, $2.00 (cloth $2.50)

A monograph identified as a "Michigan business study" and subtitled, "Problems of Taxation, Finance, and Accounting," this case-backed exposition culminates in a chapter on accounting presentation of long-term leases and proposes departure from "conventional" procedures in the direction of considering the lease obligation and the property as liability and investment, respectively.

Articles

The Three Elements in Measuring Change in Earnings

William P. Ryan, The Controller, November 1957.

Several methods for developing analysis of variation of earnings between a base and current period are compactly presented in this article, which is furnished with tabular illustrations. The logical basis of procedures advocated is that "standard measurements for (change of) sales and cost are price change and change caused by volume."

Application of Regression Methods to Cost Analysis

Louis L. Miller, Cost and Management, October 1957.

Construction and use of statistical analyses which result in experience standards on a broad basis (and permit their correction to lower levels as favorable variances appear) are illustrated in this article.

Some Common Misconceptions Relating to Accounting Education

C. A. Moyer, Accounting Review, October 1957.

The misconceptions here discussed, numbering eight in all, are of some variety. Examples are the idea that accounting majors lack non-accounting education and that the teaching of accounting is not a strenuous life. The objective of the article appears to be to improve common knowledge of present conditions.

Faculty Responsibility With Respect to Correcting Certain Defects in the Accountant's Education

Delmas D. Ray, Accounting Review, October 1957.

A pretty thorough review is provided in this paper of discrepancies between objectives and realizations in college-level accounting education, and considerable attention is given to what teachers can do about it, with some question raised as to the adequacy of current textbooks.

Accounting for the Newspaper Industry

Guy W. Smith, Canadian Chartered Accountant, November 1957.

This compact paper sets forth the principal classifications of newspaper revenues and costs and also suggests pertinent supplementary statistical data for monthly reporting, and a form in which it might be presented.

Small Manufacturing Enterprises

W. Arnold Hosmer, Harvard Business Review, November-December, 1957.

Small and large business—their operational and managerial advantages and disadvantages—are compared and contrasted in this broad-scale study in which small enterprises emerge as "the frontier of today".

Addresses of Periodicals

Accounting Review
c/o R. Carson Cox, College of Commerce, Ohio State University, Columbus 10, Ohio. Single copy $1.50.

Canadian Chartered Accountant
69 Bloor St., East, Toronto 5, Canada. Single copy 60¢.

Controller
2 Park Ave., New York 16, N. Y. Single copy 60¢.

Cost and Management
31 Walnut St., South, Hamilton, Ontario, Canada. Single copy 50¢.

Harvard Business Review
Soldiers Field, Boston 63, Mass. Single copy $2.

MASTER PLANNING FOR YOUR COMPANY by Rayford W. Harwell*

THE ABSOLUTE NEED for long-range planning is often overlooked because of the day-to-day operating problems. On the other hand, most larger companies must attempt to look ahead from three years to ten years in their planning. The article, "Planning the Future of a Successful Product" by J. C. Freeman in the May 1957 issue of the *Bulletin* defines long-range planning as follows: "Long-range planning, a new dimension in industry, means depth of penetration in terms of investigation and perception. Depth of perception can come only from intensive planning born of critical, painstaking and minute analysis."

In short, every policy-maker knows that, like it or not, he lives in the future. His every decision must be based on some plan. Action based on the wrong plan can sometimes be fatal. For instance, an industrial organization engaged in a large number of projects, including heavy production, constant design improvement, and development of new products, requires the development of many skills, the accumulation of funds of knowledge, the careful allotment of work to the right groups, the planning of each new task before undertaking it, and a vigorous followup of performance to see that planned schedules and costs are met. To match this need, a master planning section can be established in the plant manager's office to represent him in work-

*Accounting Supervisor, Convair Division, General Dynamics Corporation, Ft. Worth, Texas.

ing out solutions to these problems. It can be responsible for organizing, scheduling, and following up the preparation of over-all company programs, proposals for potential new business, as well as plans for major changes.

Beyond preparation of programs, proposals and plans in this manner, their evaluation, prior to company commitments, should be made by a master planning board. Another of the duties of this board should be to establish the objectives and ground rules for the preparation of all long-range financial forecasts. The article, "Budgeting Policy and Practice in a Decentralized Company" by Ernst E. Bareuther and Bert E. Stromberg in the October 1957 issue of the *Bulletin*, is based on the philosophy of the authors' company that long-range planning for a five-year period is essential to the progress of the business and that complete budgets, both on a short-term and long-term basis, are essential tools. Great emphasis is placed on details of the planning. The duties of the five-year planning committee outlined in this article appear to be similar in this respect to the duties of the master planning board described here above. The master planning section should be responsible for calling to the attention of the master planning board any situation which will lead to failure to meet schedule and which cannot be resolved between the departments concerned and the master planning section.

The master planning section should not relieve the departments of their assigned functions, nor should it do their work for them. Rather, it should have the responsibility of seeing that the various pieces fit together into a fully-developed program. The functions of this section should not interfere in any way with the normal relationship of departments and their line superiors. Plans and progress should be reported through line channels at all times in the usual manner. Furthermore, the responsibilities and prerogatives of the line departments to execute their functions should remain unaffected by the master planning concept. However, the master planning section should, as one of its functions, assist the plant manager in the satisfactory discharge of his operating obligation to coordinate the various departments relative to plans and programs. The line-and-staff principle of operation permits him to delegate a large measure of the responsibility and authority for execution to his line officers and to delegate a large measure of the responsibility for the coordination of planning to his staff officers.

This arrangement spreads the managerial work load, an important consideration, and it develops managerial specialization, which is even more important. The function of the planning section staff should be to investigate, interpret, inform, advise, facilitate, and coordinate relative to programs and plans. In so doing, the section becomes one of specialized ability, knowledge, and training in the efficient planning of new programs and changes.

The controller or accountant is extremely fortunate in that he is in a position to guide and counsel the master planning section in the major decisions which effect the financial welfare of his company. He should also be a member of the master planning board and, with his overall perspective, should be one of the creative members of management. This offers him a real opportunity to contribute to managerial decisions, provide a worthwhile service, and assume his rightful place at the management head table.